**Newsletter No. 12** *PUBLISHED BY RUBBER CHEMICALS DIVISION OF* DU PONT *DEC., 1942*

# Heliozone Retards Sun Checking of Buna S Vulcanizates

BUNA S vulcanizates which are to be used out-of-doors should be protected by the inclusion of a sun-checking inhibitor in the compound. When such a protective ingredient is not included, the stocks will crack readily when exposed to either direct or reflected sunlight.

DYNAMIC SERVICE—The sun-checking of vulcanizates in static service is not of great importance, although such sun checking is undesirable. However, sun checking becomes a major disadvantage when Buna S stocks are exposed to sunlight and are flexed or deformed. When a small crack or cut mars the surface of a Buna S vulcanizate, flexing or deforming the product will cause the crack to grow rapidly by tearing and will result in early failure.

Although it is impossible to guard against all of the hazards that cause cuts or cracks in products such as belts, footwear, coated fabrics and tires, it is entirely possible to protect Buna S from sun checking by the addition of small quantities of Heliozone to the Buna S compound.

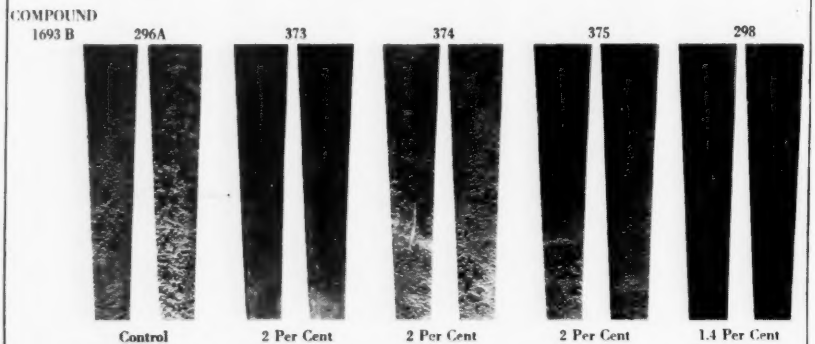
HELIOZONE EFFECTIVE—Heliozone has been of considerable advantage in improving the sun-checking resistance of natural rubber. It has even greater possibilities in Buna S stocks where all possible measures must be taken to retard the formation of small cracks or checks.

Heliozone is made from a specially selected group of waxy materials having a specific gravity of 0.90 and a melting point of 67° C. Because it melts at mixing temperatures, it disperses easily in the stock. Heliozone functions by blooming to the surface after cure, forming a smooth, continuous, transparent, colorless, plastic film which can be scraped off only with difficulty. The film retains its flexibility at temperatures as low as 0° F., and does not melt and disappear into the Buna S at hot summer temperatures.

The accompanying photograph illustrates the beneficial effect of Heliozone on the sunlight resistance of Buna S vulcanizates and compares the effectiveness of Heliozone with Neozone D, Neozone A, and Thermoflex A as sunchecking inhibitors.

FIG. 5

DIRECT SUNLIGHT — TWO WEEKS




Photographs illustrate effect of Heliozone and other antioxidants on sun checking resistance of Buna S vulcanizates (Sample stretched 15%, South exposure, 45° Vertical angle, Two weeks, August, 1942)

## Through the Mill

THE NEOPRENES—*A recently published report having this title is a valuable addition to the compounder's library. To the mechanical goods compounder it is particularly useful in these times of new products and new and changing specifications. "The Neoprenes" describes in detail the properties of the several general and special types of neoprene so that the best type of neoprene may be selected readily for any specific application. A copy of "The Neoprenes" will be gladly sent without charge to any rubber technical man making the request on his company letterhead.*

BUNA S—*Have you tried Thionex acceleration either alone or activated with Accelerator 808 or DPG? The processing, safety, rapid rate of cure at 274°F. and long curing range are the interesting and outstanding advantages of Thionex accelerated Buna S compositions. The development of improved Buna S stocks is one of the most important jobs in our laboratory today. Make the DuPont Rubber Laboratory your headquarters for discussing problems, both general and specific, regarding rubber and synthetics.*

ACCELERATORS *for stocks in which all of the hydrocarbon is present in the form of reclaimed rubber are of major importance under present conditions. We suggest the following accelerator combinations as being particularly effective in all reclaim stocks:*

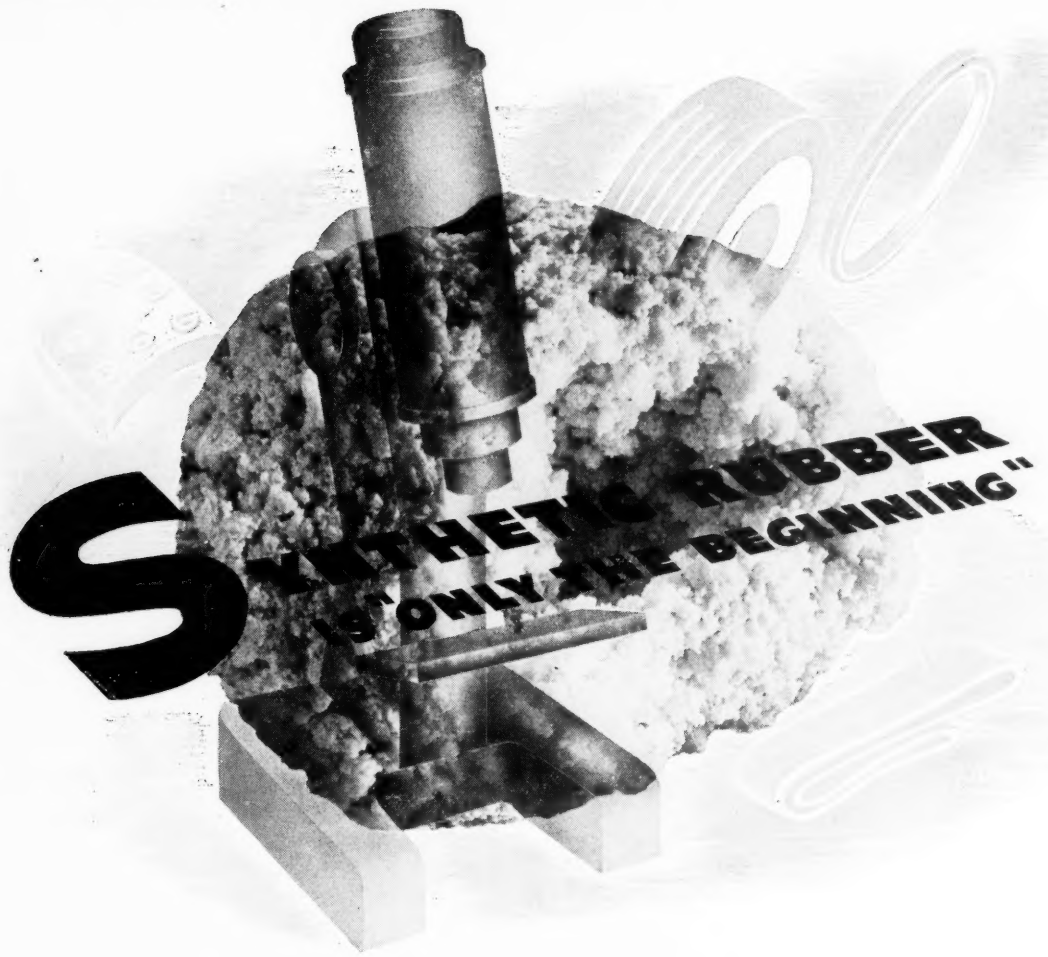
1. *Thionex - litharge*
2. *2-MT - Accelerator 808*
3. *Zenite - litharge (no zinc oxide)*
4. *Zenite - DOTG*
5. *MBTS*
6. *MBT*
7. *Accelerator 808*
8. *DOTG*

*We should be glad to recommend a specific combination to meet your particular requirements.*

**RUBBER CHEMICALS DIVISION**

*Wilmington* DU PONT *Delaware*

INDIA RUBBER WORLD, December, 1942, Vol. 107, No. 3. Published monthly by BILL BROTHERS PUBLISHING CORP. Printing office, Philadelphia, Pa. Editorial and advertising offices, 386 Fourth Avenue, New York, N. Y., U. S. A. Entered as second-class matter October 5, 1889, at the Post Office at Philadelphia, Pa., under the act of March 3, 1879. Subscription, United States and Mexico, $3.00 per year; all other countries, $4.00; single copies, 35 cents.




YOUR CUSTOMERS think of synthetic rubber in terms of tires, tubes, shower curtains and other finished products. But the new chemical compounds, out of which you as a manufacturer must fashion such products, are only new *raw materials,* many of which are basically different from the latex that has always been the backbone of the industry.

The job of adapting these new compounds to available equipment and techniques, in formulation, vulcanization and fabrication, and the development of new processing materials are *chemical* problems—problems that demand the fullest cooperation from your chemical sources of supply. And time is of the essence—for the greater the volume of synthetic rubber America produces, the sooner the war can be brought to a victorious conclusion.

Wishnick-Tumpeer, Inc. is lending a hand. Already from the Witco Research Laboratories have come new and remarkable materials that speed the production and improve the quality of synthetic rubber products. Among these are Witco Carbon Black No. 12, which increases heat resistance in tire treads... Witcarb, a special filler that improves tensile and tear resistance ...Witco Softener No. 20, which saves milling time ...Stearite, a highly effective dispersing and vulcanizing aid. All of these developments were made possible by the company's special knowledge of rubber chemistry, and its long experience in helping the rubber industry solve compounding problems. This service is typical of the cooperation Wishnick-Tumpeer, Inc. gives to the industries using chemicals, oils, pigments, asphalts and allied products.

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| | |
|---|---|
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| Stearic acid | 0.5 |
| THIOGEN 10* | 25. |
| Benzothiazyl disulfide | 1.25 |
| Diphenyl guanidine | 0.25 |
| Channel black | 50. |
| Zinc oxide | 5. |
| Sulfur | None |
| Cure (min. @ 45 lbs.) | 30 |
| Tensile @ break (psi.) | 4200 |
| Elongation @ break (%) | 680 |
| Shore hardness | 71 |
| Abrasion (DuPont index) | 8 |

*Contains 2.5 parts active sulfur

**Proper sulfur distribution is a problem with the butadiene copolymers, particularly those of the Buna N type. THIOGEN, a solution of active sulfur in a pure hydrocarbon base, offers the possibility of readily obtaining excellent distribution of sulfur where such distribution is not obtainable through ordinary compounding means. THIOGEN 6 and THIOGEN 10 contain 6% and 10% active sulfur, respectively.**

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December, 1942

To The Rubber Industry
Everywhere.

Dear Friends:-

Your understanding cooperation through these war months has been most gratifying. No manufacturer ever served so grand a group as we have the good fortune to work with in the Rubber Industry. We do appreciate your continuing friendliness under trying circumstances.

In 1943 we covet the opportunity to help you win a war and build a lasting Peace. To that end we pledge you every assistance possible.

May we all find within ourselves the faith and the courage and the energy to do this job speedily and well!

Merry Christmas!

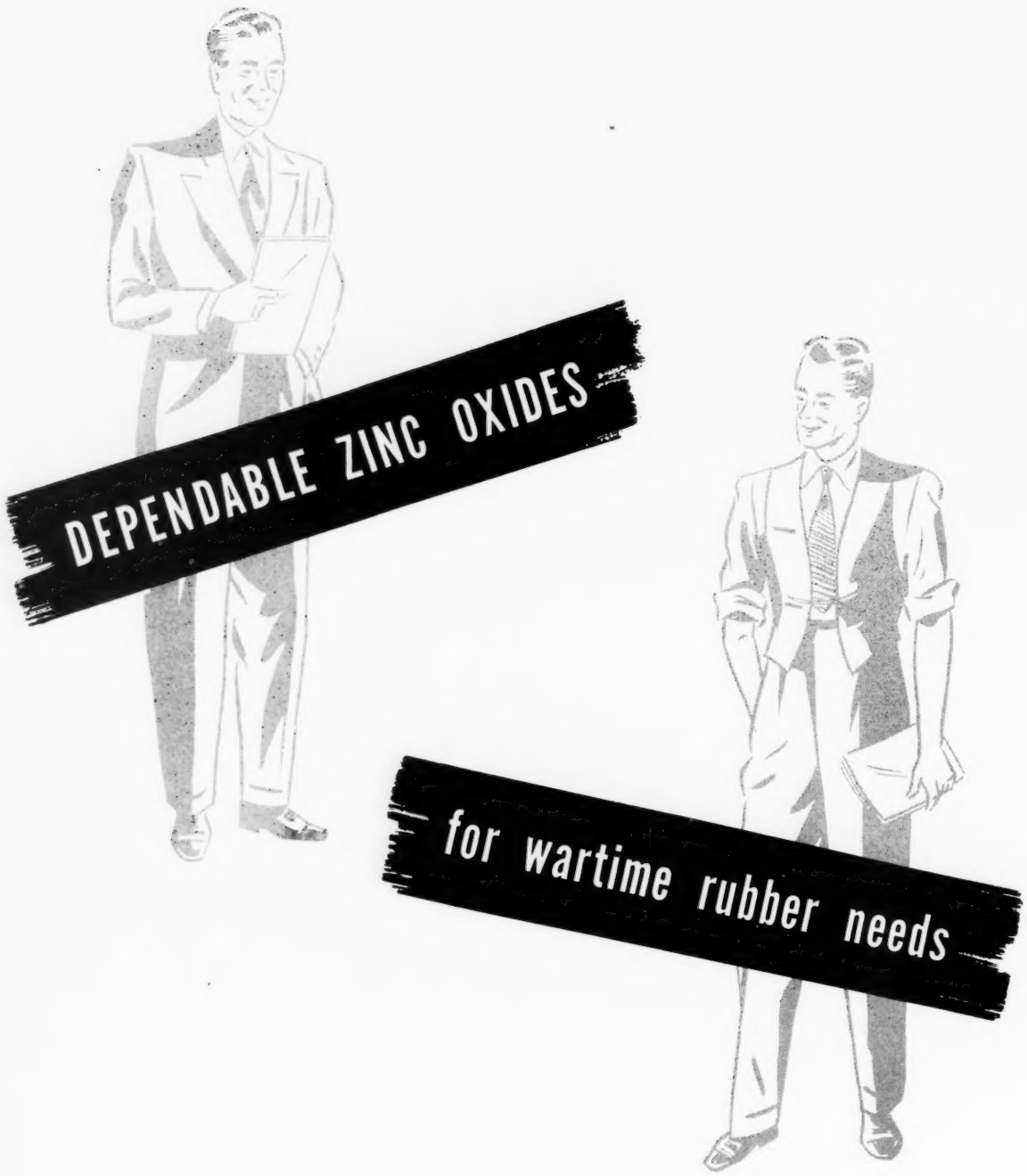
Most sincerely yours,

John Royle & Sons

JOHN ROYLE AND SONS

Kv:EMB

*A Joyous Holiday Greeting*




# AZO

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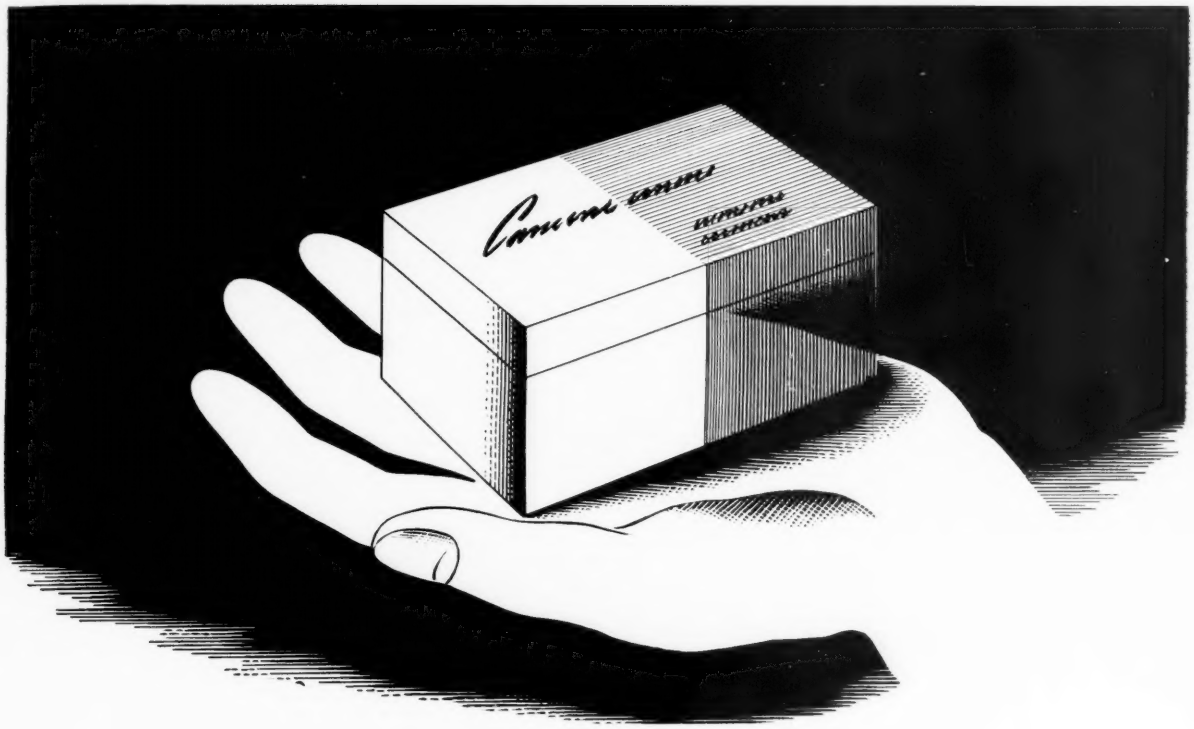

# *Your Product* PLUS OUR RESEARCH

**This is the age of the specialist. The era of the man who has so narrowed his field of concentration that he knows practically everything about almost nothing.**

**Now, as compared with the total of your manufacturing problems, finishing is practically nothing at all. Yet, about finishing, our specialized engineers know a great deal.**

**To take advantage of this specialized ability may, and often does, bring about such things as lowered production costs, shorter manufacturing time, and increased product salability. And those are things you know about yourself.**

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Continental "AA" is specially processed to offset this extra heat. Its low heat generating characteristics maintain just the right balance between wear resistance in the tread compound and heat generation in the tire itself. In the production of today's heavy-duty tires—particularly tires designed for truck, bus and combat service under the worst in climatic extremes and the most severe treatment—Continental "AA" fills a vital need.

### THIS NEW BLACK IS EASIER PROCESSING, TOO!

The ease with which Continental "AA" may be processed gives it still another advantage over standard grades of black used in passenger car tires. And of course, the same high quality that characterizes all grades of Continental Black has been maintained, through traditional methods of rigid laboratory control. But send for samples —find out for yourself how completely Continental "AA" meets your every requirement today.

### ESPECIALLY IN YOUR BUNA S FORMULATIONS

Now is the time to evaluate the characteristics of Continental "AA" in your Buna S formulations. Let us send you additional samples for this purpose—while you are still experimenting with this type synthetic rubber.

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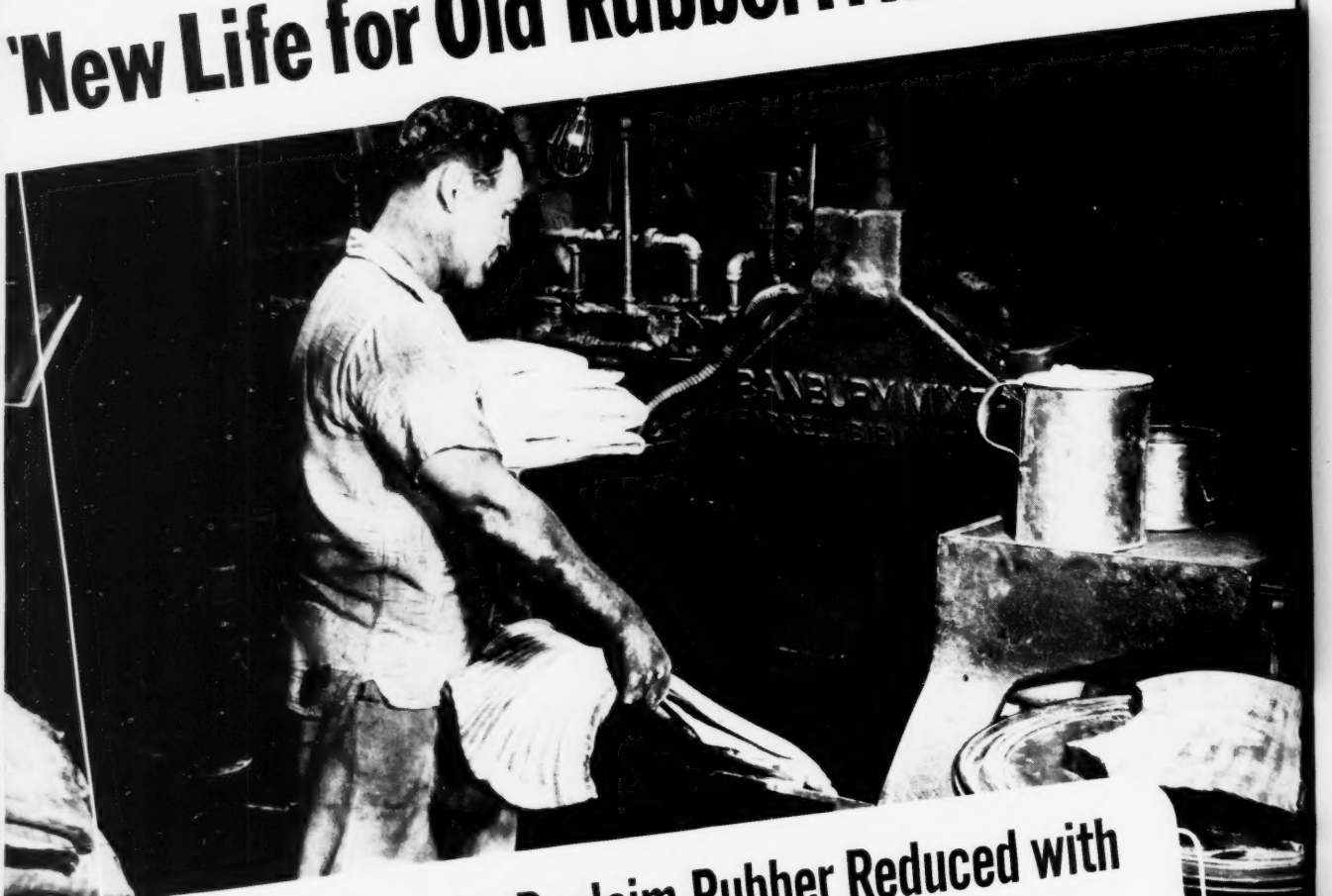

## Milling Time for Reclaim Rubber Reduced with SUN RUBBER PROCESSING OIL

In plasticizing and milling reclaim rubber, a large manufacturer had difficulty in getting a satisfactory flow of compound on the mills . . . and was troubled with excessive misting. Acting upon the recommendations of a Sun Oil Engineer—one of those Doctors of Industry—this company changed its processing oil to Sun Circo Light and here's what happened . . .

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- **MISTING FROM COMPOUND ELIMINATED . . . due to Circo Light high boiling point.**

This is but one of the many instances in which SUN Circo Light is helping manufacturers of rubber products to speed up processing . . . to reduce cost of compounding . . . to increase percentage of inert material . . . to produce more goods from rubber stocks on hand . . . to maintain desired physical characteristics. Ask a Sun Doctor of Industry to tell you how SUN Rubber Processing Oils can help you accomplish similar results. Write . . .

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Thiokol synthetic rubbers have improved oil-loading hose in many other ways. Previous types necessarily embodied oil-vulnerable, natural rubber liner reenforced with heavy metal bands. The use of flexible, oil-proof Thiokol synthetic rubber removed these disadvantages, decreased weight, increased ease of handling and provided a far longer hose life.

An engineering material proved many years before Pearl Harbor, Thiokol synthetic rubber is helping us wage successful war on land, sea and in the air. Much new technical data on forms and applications of this synthetic have been amassed by our research and development staff. If your work is war work, ask for it.

*Thiokol Corporation, Trenton, New Jersey*

Thiokol*
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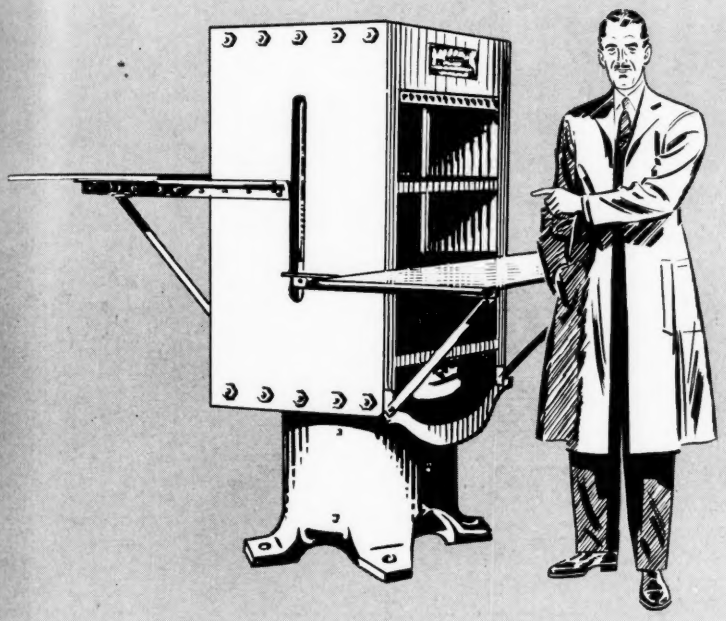

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molded pieces

## . . . . install Southwark Hydraulic Presses

Increased requirements for molded articles call for presses *rugged* enough to stand production demands placed upon them, *accurate* in performance to maintain highest quality, and economical in operation and maintenance so that unit cost can be kept low. To meet these demands, Southwark engineers have developed powerful presses for molding stronger and larger pieces.

The press illustrated is but one of many types of Southwark hydraulic steam platen presses engineered to meet today's requirements in rubber and plastics manufacture. When you're planning new plant equipment for the competition of tomorrow it will pay you to specify Southwark.

Southwark hydraulic molding presses have proven their reliability, have shown the way to reduced production costs, have helped many a company do a better job—more economically.

**BALDWIN**

*Southwark*


DIVISION OF THE BALDWIN LOCOMOTIVE WORKS • PHILADELPHIA

**December, 1942**

VOLUME 107 NUMBER 3

A Bill Brothers Publication

# INDIA RUBBER WORLD

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B. BRITTAIN WILSON, General Manager
EDWARD V. OSBERG, Technical Consultant
ROBERT G. SEAMAN, Technical Editor
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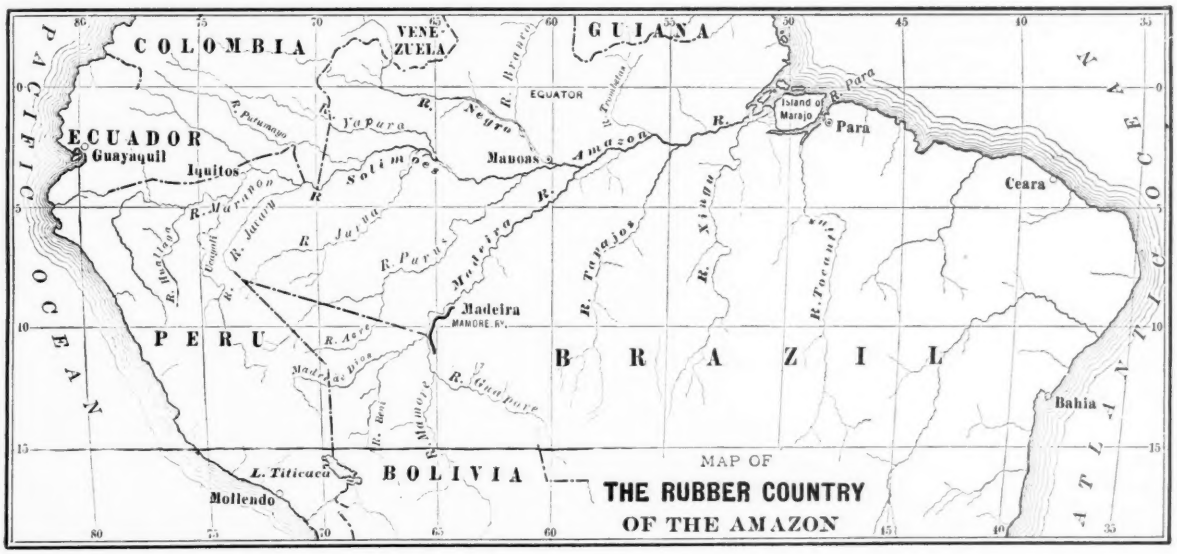



# The Production of Rubber in South and Central America


**Byron V. Crane**


FOR more than 30 years the area of largest rubber production and the one upon which the United States has been almost wholly dependent was the Far East, which in 1940 supplied 98.7% (1,350,656 long tons)[1] of the world's output. All other producing countries supplied 1.3% (39,033 long tons)[1] in that year. Of this amount 17,601 long tons[1] were produced in South America, and an additional 4,106 long tons[1] of guayule were harvested in Mexico.

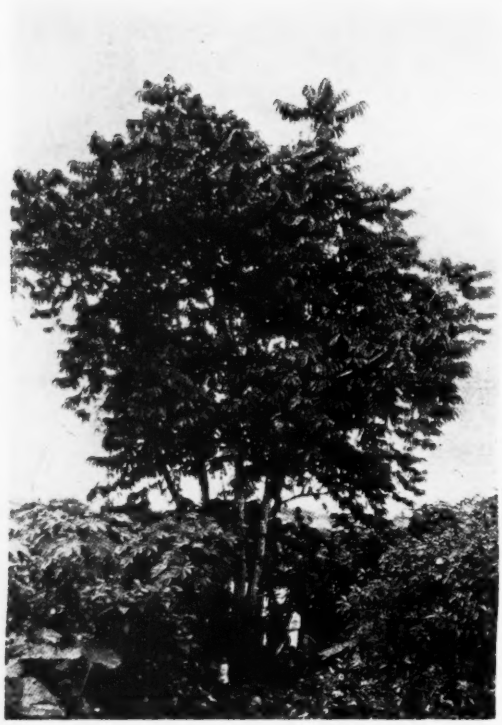
It is a natural economic consequence of the loss of Far Eastern rubber to anticipate increased production in Latin American countries. The supply that can be obtained in this and subsequent years from wild and cultivated growth in South and Central America may be determined to an approximate extent by a study of the methods, conditions, and difficulties of past production and a survey of recent developments indicative of increased future production.

## Early History

Crude rubber has been an article of international commerce for more than 130 years. Prior to the establishment of the plantation industry in the Far East, the markets of the world were supplied with wild rubber from the tropical jungles of Africa, Asia, and America. Among the countries of Central and South America which, under profitable conditions, have produced latex from wild or cultivated rubber-bearing plants are: Bolivia, Brazil, British Guiana, Colombia, Costa Rica, Dutch Guiana, Ecuador, Guatemala, Honduras, Mexico, Nicaragua, Panama, Peru, Trinidad, and Venezuela. By 1890 all of these countries were engaged in wild rubber production and the establishment of rubber plantations, but no area ever approached in volume the output of the Amazon Valley.

The coastal city of Belem (Para), Brazil, founded in 1615, commenced to have some economic importance as a port for foreign trade about 1755. Some 85 years later,

[1] "Statistical Bulletin of the International Rubber Regulations Committee", Oct., 1941.



Wild Rubber Tree on Coatzacoalcos River

as a result of its location at the mouth of the Amazon, and the discovery of the vulcanization process, its position as the rubber capital of the world was assured. Until about 1850 shoes and clothing were sent to South America for waterproofing. In the trade year 1836-37, 130,979 pairs of waterproofed shoes and 63 pounds of crude rubber were exported from Brazil, but after 1845 crude exports began to exceed in volume those of processed rubber products as European and American manufacturers gradually increased the production of rubber articles.

Steam navigation, introduced on the Amazon and its tributaries in 1853, facilitated transport and travel between jungle rubber camps and Belem, and the opening of the river and its branches to international transportation in 1866 marked the beginning of Brazilian rubber prosperity. Manaos, the capital of the State of Amazonas, 1,300 miles inland and near the confluence of the Amazon and Negro rivers, was then established as a second center of the rubber trade.

The Amazon basin contains about 2,160,000 square miles, of which 1,500,000 are in Brazil. It extends from the Atlantic Ocean to the eastern watershed of the Andes Mountains, a distance of 3,000 miles, and includes portions of Bolivia, Colombia, Ecuador, Peru, and Venezuela. The Valley is about 200 miles wide at the delta and broadens to 1,500 miles at the western end. In addition to the Amazon, 37 of its tributaries (seven are more than 1,200 miles long) drain the region. The greater part of the Valley has been thoroughly explored, and the wild rubber production possibilities of only the most inaccessible parts remain unknown. *Hevea* and other botanical classes of rubber producing trees are found from sea level to 2,000 feet altitude throughout, and estimates of wild rubber trees range from three hundred million to half a billion, of which it is said less than 10% have been exploited.

There are three principal producing districts in the Amazon drainage. Amazonas, the largest, centers at Manaos, and includes the lower portions of the Purus, Jurua, and Negro rivers. The Territory of the Acre and adjacent Brazilian and Bolivian uplands, which include Madeira River forests, rank second, but this area is handicapped by decreased navigability of the streams during the dry season. The yield here is greater than on the lower Amazon, which has a shorter collection season because of the longer flood periods. Islands which extend for 500 miles from the Atlantic along the large delta of the Amazon, and the alluvial shores of the main stream and its southern tributaries flooded at low tide produce "Island rubber." This, the third district, is largely in the state of Para.

## Rubber Producing Species

About 500 plants are known to have a latex containing rubber in varying amounts. The range is from 1% (milkweed) to about 35% (tropical *Hevea*).

The principal rubber producing plants in Central and South America are:

| Class | Species | Principal Locations |
|---|---|---|
| *Hevea* (Para rubber) | *Brasiliensis* and more than 20 others. | Brazil states of Amazonas, Para, Matto Grosso, Goyaz, Maranhao, and the Territory of the Acre and parts of Bolivia, Peru, Colombia, Ecuador, Venezuela, Guianas |
| *Sapium* | Ten or more species (two give a good grade of latex. Others are exceedingly resinous). | Amazon Basin |
| *Mimusops* (Balata) | At least 12 species | Countries of tropical South America |
| *Manihot* (Ceara or Manicoba rubber) | Several species | State of Ceara, Brazil |
| *Castilloa* (Caucho) | *Ulei elastica*, and other species | Southern Mexico to Brazil |
| *Hancornia* (Bahia rubber) | *Speciosa* | Brazil states of Bahia, Perhambuco, and Matto Grosso |
| *Parthenium* (Guayule) | *Argentatum* | Mexico |

The largest production has come from the wild growth of *Hevea*, *Castilloa*, *Mimusops*, and the guayule shrub. Brazil has always been and is today the largest single rubber producing country of Latin America.

*Hevea* and other rubber trees require high humidity, heavy rainfall, a uniform daytime temperature of about 90° F., and a minimum night temperature of about 70° F. Such climatic conditions are found between 20° south latitude and 20° north latitude. But most wild rubber comes from the zone between 10° N. and 10° S. latitude. The mean annual temperatures recorded for the rubber districts of the Amazon are: Belem, 78.4° F.; Manaos, 80.9° F.; Iquitos, 72.5° F. Usually the temperature drops from five to 15 degrees at night. The total annual rainfall at Belem averages 97.8 inches with 152 wet days; at Manaos, 65.1 inches with 183 wet days; 93.2 inches at Iquitos, with no recording of the number of wet days. In general, the total precipitation is less in the Amazon Valley than in the rubber-growing areas of the Far East.

The average daily yield per tree of *Hevea* has been calculated at 1½ ounces, which would produce an annual yield per tree, in a tapping season of 140 days, of five pounds of dry rubber, but Schidrowitz[2] doubts that any large proportion of the Amazon trees would produce so high a yield over a number of years.

Most of the diseases known to attack *Hevea* are found in the wild Amazon trees which are not considered, on the whole, more healthy than Malayan plantation trees. Leaf blight, brown bast, black stripe canker, pink disease, wet root rot, and others have been observed. Millions of seedlings perish, but the survival has been more than adequate.

## Wild Rubber Production Problems

It has been charged that Brazil and other rubber pro-

[2] "Rubber." Philip Schidrowitz. Methuen & Co., Ltd., London, England, 1911, p. 38.

ducing countries of Latin America were indifferent to competition offered by plantation development in Asia. But as early as 1913 measures were recommended by the Para Rubber Congress, Bolivian officials, and other organizations and individuals to increase production and decrease cost. These included construction of railways, lower export taxes on crude rubber, reorganization of rubber commerce, systematic administration, reduction of living costs and improved sanitation in jungle areas, instruction in improved methods of tapping, adoption of modern methods of smoking,-practical means of elimination of adulteration in the smoked *pelles* or balls, exploitation of untapped areas, encouragement of migration of plateau Indians to the Valley, and the abolition of import taxes on plantation equipment. However such concrete suggestions for improvement and stabilization of the industry were little practiced, and the organization of production, transportation, and marketing has remained essentially in the pattern created when tropical American rubber had no serious competitor.

Improved modern methods of coagulation have been sparingly adopted. Some clean sheet rubber is produced, but most of the product still arrives at markets in balls that contain much dirt and foreign matter.

Efficient methods of gathering latex were difficult to establish because the trees are widely scattered. The great expanse of an area under tapping almost precludes proficient management and administration from a central location. The worker had to make his camp near a considerable number of old trees to assure a daily collection of latex consistent with his expenditure of time and labor. A trail about six miles long, blazed through the forest, reaches from 130 to 150 trees. The gatherer considered tapping and collection from this number sufficient work for one day. The season extends from May to December, the dry period in most of the Amazon region, but many natives were averse, through long custom, to working more than 100 days a year, and the patterns of their established habits were not easily changed.

The workers received most of their payment in food supplies against future deliveries. The high price of food makes the sustenance of the wild rubber gatherer the chief item of production cost. Staples were from three to ten times higher than in Rio de Janeiro or Belem, depending upon distance of the workers' camps from the source of supply. The price of food, however, could have been decreased by growing farm products nearer the rubber areas, but efforts to induce the rubber gatherer to cultivate his own food from gardens on cleared land in the forests have met with little success.

Natives also found the work unattractive because living conditions in the remote jungle were primitive and less healthy than in other districts. After 1915 work was concentrated on the lower Amazon where labor was more plentiful and where rubber could be obtained more cheaply than in places far distant from Belem. Importation of labor was recognized as a necessity to maintenance of previous production, especially on the upper rivers of Brazil, Bolivia, and Peru. Workers were usually sufficient in Para, but relatively scarce in most of Amazonas and the Acre, and very scarce in Matto Grosso. In 1921 there was some discussion of importing Orientals because sufficient native labor could not be recruited, and it was believed that coolie labor would increase production and at the same time lower costs. But no wide immigration of such labor occurred. In 1925 the base wage was 62¢ a day in Peru; 45¢ in Bolivia; 25¢ to 42¢ in Brazil. These amounts often included food as part payment. An average of 35¢ per day was paid Indian, Javanese, and Chinese labor in the Far East at that time.

A serious deterrent to increased production has been excessive transportation rates. In 1915 some reduction was obtained in water freight rates. Later, pooling of ships on the rivers under a central administration was recommended to reduce further transportation costs. Rail and highway transportation has not been greatly extended in the Amazon. The Madeira Mamore railway was organized in 1907 and completed in 1912. It paralleled the Madeira River from its confluence with the Amazon to the rubber district of northern Bolivia. But operation was unprofitable because of the decline of rubber production, and the road was in receivership October 13, 1914. For many years thereafter only minimum service was maintained.

## Wild Rubber Statistics

From 1827 to 1939 inclusive, crude rubber exports from the Amazon Valley totaled 1,089,051 long tons,[3] a figure considerably less than the 1940 world production (1,389,695 long tons), and of this total probably 20% should be deducted for shrinkage in storage and transit.

In 1890 the Amazon country supplied 65% of the world's rubber requirements. By 1900 this figure had dropped to 50% and by 1922 to 7%. Plantations in the Far East were established on an extensive scale about 1905, and extraction of Asiatic rubber in commercial quantities began in 1911. From that time it has been exceedingly difficult for wild rubber to compete in price with the economically cultivated product of Asia for no appreciable improvement has been applied to the primitive and wasteful methods of preparing the forest product in Latin America.

The following table[4] shows the production of wild rubber in comparison with the expansion of plantation developments in the Far East during a decisive period. The figures are long tons.

[3] "Brazil 1939/40, an Economic, Social, and Geographic Survey." Ministry of Foreign Affairs, Rio de Janeiro, Brazil, p. 193.
[4] *Ibid.*, p. 189.

Indian Tapping a *Castilloa*

| Year | Brazil | Other America and Africa | Asia | Total |
|---|---|---|---|---|
| 1900..... | 26,750 | 27,136 | 4 | 53,890 |
| 1910..... | 40,800 | 21,500 | 8,200 | 70,500 |
| 1912..... | 42,410 | 28,000 | 28,518 | 98,928 |
| 1914..... | 37,000 | 12,000 | 71,380 | 120,380 |
| 1916..... | 37,000 | 17,000 | 110,000 | 164,000 |

South American output had approximated 60,000 tons in 1910, but improper tapping methods had vitiated the trees easily accessible to main routes of river transportation, necessitating opening of areas in more remote districts if production was to be maintained. In 1913 Asiatic production exceeded Brazil's output of 39,370 tons by 8,248 tons, and in that year failures of rubber firms in Brazil totaled $15,564,850[5] as a result of inefficient methods in the face of sharp competition from the Far East. Malayan plantation rubber of a quality approaching that of the best wild rubber was produced at a cost of 22*c* a pound, as compared with 58*c* a pound for the upriver fine grade from the Madeira River district and Bolivia.[6] By 1916 the trees on the islands near Belem were exhausted, and the once richly productive districts of the Purus and Solimoes Rivers were tapped out and abandoned.

During World War I the Allies were assured of adequate rubber supplies from the Far East. Brazilian production, or that of any other Latin American country, did not materially increase, but of Brazil's output a larger percentage was sent by direct shipment to the United States. In 1913 about 40% of Brazil's production came direct to this country. By 1919 that figure had increased to 70%, but after that year Brazilian shipments reverted to the pattern established before the war.

During the next 20 years South American production declined to figures below those of the war years. Only 6,500 tons were produced in Brazil in 1932, a figure lower than that of 1870, and only 4.4% of the value of all Brazilian exports. But in 1937, Brazil's rubber exports rose because of higher market prices incidental to control of Far Eastern exports by the International Rubber Regulation Committee. In 1938, Germany received 7,250 tons, or about 60% of the 12,037 tons constituting Brazilian exports of that year. But in 1939 and 1940 the United States obtained the largest part, buying approximately 50% of the total exports, which were 11,804 tons and 11,835 tons, respectively. In 1941 United States imports from Brazil dropped to 5,000 tons.

Rubber consumption has been increasing in Brazil and other South American countries during the past few years, and Brazil cannot at present meet demands of both overseas markets and Latin America rubber industry requirements. Brazil's consumption of crude rubber in 1941 was 8,500 tons from a production of 19,000 tons, and because Japan sought to buy large quantities of crude in Brazil for Germany, Brazilian manufacturers found it necessary to ask the government to curb exports to assure an adequate supply for local consumption. President Vargas issued a decree law that provided a two-day option for the Brazilian rubber industry on all crude rubber offered in the local markets and at the same prices ruling in free international markets.

In 1940 rubber was not among the seven leading exports of any South American country. Brazil, in 1941, ranked seventh of all rubber producing countries with a tonnage greatly below the leading export nations.

## Plantations Development

There were many attempts by United States, European, and native companies and individuals to grow rubber trees in Latin American countries prior to the establishment of the Ford plantations in Brazil in 1927, but none of these ventures achieved any considerable success. Land was cleared for cultivation of rubber in Brazil as early as 1883, and planting continued sporadically for more than 40 years. In 1910, Para and Amazonas made free grants of land up to 20,000 hectares (8,094 acres) for rubber planting. Freight rates and export taxes were reduced, and free rail and water transportation furnished for all material and livestock shipped to rubber estates. In return for these concessions planting companies were to agree to plant no less than 20 seringals (approximately 4,000 trees) annually, to cultivate rice, corn, and beans as supplementary crops, and to establish schools. But despite government aid no real progress was made.

Small acreages of planted *Hevea* are found in many places in the Amazon Valley, notably in the vicinity of Belem; on the Tapajos; near Manaos; on the Madeira; in Acre Territory; and in Bolivia and Peru. They vary in size from a few to 20,000 or more trees. The failure of the trees to reach profitable productivity was attributed by United States Government scientists to improper methods of soil preparation, seed selection, and planting, and to lack of proper care during growth.

Cultivation of *Hevea* in Peru was encouraged by the government which established experimental stations. In 1911 it offered to pay premiums equivalent to about 25*c* in United States money for each rubber tree of plantation growth at the age of three years. But transportation difficulties were such that a successful industry could not develop even with subsidies, and falling prices of rubber contributed additional barriers.

Plantations becoming productive between 1910 and 1920 in the Guianas compared favorably with Malayan ones in rate of tree growth, yield per acre, and production cost; but leaf disease, which became epidemic, could not be successfully combatted.

Leaf blight has been an important factor limiting plantation growth in South America. In mixed forest growth wild rubber trees are not greatly affected, but the fungus has been quick to spread among closely spaced plantation trees, set 100 or more to the acre. In the past two years, however, satisfactory disease-resisting strains of *Hevea* have been developed in South America. One was attained by cross-pollination and selective breeding of seeds from trees which have survived in disease-ridden regions of Panama, Costa Rica, and Brazil.[7]

There were 95,000 acres of *Castilloa* on 118 Mexican plantations in 1907. Ten years later the number of plantations had increased to 150, representing a total investment of sixty million Mexican dollars. The greatest number of plantations were in the states of Vera Cruz and Chiapas, and most of them were abandoned during the civil strife of 1919. The area was overrun with bandits who looted the buildings and burned the machinery. American foremen and supervisors left the country, and the laborers scattered. The land in the ensuing years reverted to the wild state. An absence of government encouragement and a paucity of labor at wages comparable to those paid in the Far East have been contributing factors to failures of attempts to cultivate both *Hevea* and *Castilloa* in Mexico, in the past.

Between 1900 and 1910 extensive plantings of *Castilloa* were made in Guatemala, Costa Rica, Honduras, Nicaragua, and Colombia. Cultivation problems were not successfully overcome, and failure and bankruptcy of the companies resulted; in a few years many of the plantations were submerged in jungle growth.

## Recent Developments for Future Production

In 1922 the United States controlled only 2.8% of the

[5] India Rubber World, Apr., 1914, p. 342.
[6] *Ibid.*, Mar., 1914, p. 325.
[7] For further details see India Rubber World, June, July, and Aug., 1942—"Hevea Rubber Culture in Latin America" by R. D. Rands.

world's supply of crude rubber. All of this, except a small acreage in the Philippine Islands, was cultivated under the flags of other nations. With funds provided by Congressional action the United States Department of Commerce began in 1923 studies concerning the possibility of developing adequate supplies for this country and under United States control in the Amazon basin and other areas. Results of the studies[8] were published in 1925. Further experimental work was discontinued in 1931 through lack of appropriations.

American-controlled plantations in foreign countries in 1938 supplied 40,000 tons, or about 8% of United States imports. The area of such plantations was about 260,000 acres, of which the largest part was in the Far East. Holdings of the Firestone Tire & Rubber Co. included about 30,000 acres of mature trees in Liberia, Africa. In the Western Hemisphere the only notable developments were the 20,000-acre plantation of the Ford Motor Co. on the Tapajos River in Brazil, and experimental sites of the Goodyear Rubber Plantations Co. of 2,800 acres near Lake Gatun in Panama and 1,000 acres near Cairo, Costa Rica. Goodyear has increased its Central American estates to a total of 5,300 acres, and United Fruit Co. is developing 1000 acres near Telo, Honduras. Only comparatively small yields can be expected from these Goodyear and United Fruit Co. plantations in the next few years although 1,000 acres of the above-mentioned 5,300 acres on the Goodyear estates should be in bearing this year. Production in 1942 on the Fordlandia plantation has been estimated at various figures up to 4,000 tons from 33,000 trees reported to have reached tapping age. The expected production in 1950 has been announced at 7,500 tons. Reportedly an eventual production of 38,000 tons is planned, which compares with the total annual production of wild Brazilian rubber in peak years.

On June 22, 1940, the United States Congress appropriated $500,000 for investigation directed toward the development of rubber production in the Western Hemisphere. A month later the Bureau of Plant Industry began a three-year program of cooperative action with 13 Latin American nations.[7] Research in breeding, production, and disease; surveys of potential producing areas; acquisition of land; and the construction of experimental stations were undertaken. Several nurseries were established, and more than eight million trees planted on selected sites.

In Brazil the plan has been expanded to include an expenditure of $1,750,000 for reclamation; $500,000 for colonization; and $400,000 for rubber planting on the basic assumption of an eventual cultivation of 300,000,000 trees. Eight centers for experimental work were established in the Amazon Valley in 1940 and 1941, and it is reported that more than 1,000,000 selected young rubber plants brought from African and Asian plantations for grafting with native plants are under cultivation.

The loss of Far Eastern rubber supplies to the United Nations has intensified interest in wild and plantation rubber production in Central and South America. An agreement signed March 3, 1942, by representatives of the United States and Brazil provides a $5,000,000 fund to be used by the Rubber Reserve Co. in collaboration with the Brazilian Government in developing raw rubber production in the Amazon Valley. After the rubber project has been firmly established the industry will be further aided by a portion of a $10,000,000 credit provided for in another series of notes exchanged by the two governments.

Steps have been taken to facilitate immigration from the northeastern states of Brazil into the Amazon area. Protective labor legislation and financial support for improvement of sanitary and medicinal facilities for rubber gatherers have been provided. Free quinine and malaria vaccines for workers are part of the program. Tappers are being sought and instructed in the use of a hand mangle for processing sheet rubber for smoking, of which 1,000 have been ordered for use in the Amazonian jungles. Several large supply centers have been built throughout the rubber producing region which will have available large quantities of food, equipment for rubber collection, medicinals, etc. Barracks for housing the workers, while they are engaged in rubber collection near the central station, or as means for housing of transient workers on the way to collection centers farther into the jungle have been and are being built.

Small units are an important part of the projected wild rubber collection and plantation development.[9] Small unit rubber production has been tested on the Costa Rica estate of the Goodyear Rubber Plantations Co., using simple inexpensive equipment of the sort available to small tropical farmers. Such material consists of rough timbers and poles for building factories for sheet rubber production, hand-made wooden paddles, and discarded oil drums and kerosene cans. The experiment has proved that crude rubber of high quality can be produced with such equipment on an investment of not more than $50.

Individual producers are encouraged to use the government agency as sources of supplies, stock, and technical assistance. They may obtain loans from the Brazilian bank handling funds for the rubber production program and by this means establish credit at one of the central supply depots. By means of stabilized prices on supplies, production costs may be kept at a reasonably steady level. A 48¢ a pound price for first-grade smoked sheet rubber, with comparable prices for other grades guaranteed by the government agency, will furnish the incentive for maximum production of rubber. Field technicians will be available to help the producer with his problems and show him the best methods to obtain maximum yields.

By means of various types of shallow draft boats, ferry boats, barges, tugboats, etc., from the United States or any other source, transportation of rubber down the Amazon to the coast for shipment to the United States and transportation of supplies and men to the rubber producing regions on the return trip is being provided. It has been proposed to dredge a 60-mile canal between the Negro and the Casaguire, a branch of the Orinoco. Four or five years will be necessary to complete construction of the waterway, but it will materially reduce the future cost of rubber from Northern Amazonas and Venezuela. Air transport will also supplement other means of transportation whenever special advantages can be gained by this means.

The immediate total Amazonian rubber that may be obtained this year is placed at 15,000 tons. This will increase yearly as the new program develops. This project by Brazilian Government in cooperation with United States government agencies has moved forward rapidly, and a large share of the credit for the progress to date should go to the officials of the Brazilian Government who have cooperated whole-heartedly with the United States Government officials in working out the details necessary for the expansion of rubber production in Brazil.

The United States during the past several months has signed agreements with nearly all of the Latin American countries which have severed relations with the Axis and is spending large sums of money in these countries to encourage increased rubber production. In the Urabez re-

[8] "Rubber Production in the Amazon Valley," W. L. Schurz, O. D. Harges, C. F. Marbut, and C. B. Manifold. Trade Promotion Series No. 23, Crude Rubber Survey, Bureau of Foreign and Domestic Trade, Department of Commerce, Government Printing Office, Washington, D. C.

[9] "Small Farm Rubber Production." W. E. Klippert, *Agriculture in the Americas*, Mar., 1942, p. 48.

**Smoking Para Rubber, Peru**

gion of Colombia a cultivation program under government supervision and with the aid of United States technologists has been started. Peru has publicized plans for resumption of its wild and plantation rubber industries. In 1917 (the last significant crop year) 2,455 long tons were produced. The wild trees are believed to have recovered from the careless exploitation of the past, but most of the future harvest is expected to come from abandoned plantations now being prepared for production. Ecuador hopes to quadruple in 1942 its 1941 production of about 700 long tons. Completion of roads in remote areas will alleviate transportation difficulties. The Export-Import Bank of the United States has loaned $5,000,000 for *Hevea* plantation and other agricultural development in Haiti. It has been estimated that full development of the 70,000-acre project will produce 30,000 tons annually by 1947, and an eventual maximum supply of 35,000 tons.

A chronological list of the agreements and events which have resulted from the work of the State Department, Department of Commerce (Rubber Reserve Co.), and the Board of Economic Warfare in developing and insuring that we obtain all the rubber we can from South and Central America follows.

April 23, 1942 — Rubber Reserve Co. announces that we will help with development of rubber resources in Peru and will acquire all rubber produced in excess of the amount needed for essential uses by that country for a period of five years.

May 7, 1942 — Brazilian Minister of Finance announces that we will purchase all rubber produced in Brazil in excess of that required for their own uses for the next five years.

June 16, 1942 — State Department announces that Rubber Reserve Co. will purchase entire Costa Rican rubber production for the next five years.

June 19, 1942 — WPB on recommendation of the BEW prohibits the importation of rubber and rubber products except by subsidiaries of the Reconstruction Finance Corp.

July 16, 1942 — State Department announces agreement with Bolivia to buy all that country's rubber except that required for its own use for the next five years.

August 13, 1942 — State Department announces agreement with Trinidad and British Guiana to purchase all their rubber for the next four years.

August 18, 1942 — State Department announces agreement with British Honduras to purchase all rubber until the end of 1946. Agreements with the Republic of Honduras and El Salvador were announced at about the same time.

September, 1942 — Panama and Guatemala agree to sell all rubber produced and not needed for internal consumption to us until the end of 1946 according to the State Department, Rubber Reserve Co., and BEW announcement. Mexico has also agreed to sell any exportable surplus of tree rubber and all guayule and other plant rubber produced until the end of 1946 and in return will receive a substantial development fund for the purpose of obtaining maximum production of wild rubber in Mexico. Provision in the agreement was also made for restrictions on the use of rubber products in Mexico.

October, 1942 — The State Department, Rubber Reserve Co., and BEW announced the signing of a rubber agreement with Venezuela whereby all rubber locally produced and not required for domestic consumption will be purchased by the Rubber Reserve Co. The agreement is renewable yearly until the end of 1946. Rubber Reserve will also provide aid totaling $500,000 to assist in rubber production and transport.

Since August 6, 1941, Rubber Reserve Co. has taken over the purchase and sale in the United States of all grades and types of rubber including that from South and Central America. Prices were fixed for all grades of Far Eastern plantation rubber starting with 22½¢ a pound selling price for No. 1-X ribbed smoked sheets and with comparable prices for other grades. Selling prices for South and Central American rubbers, except for guayule at 17½¢ a pound (Rubber Reserve Co. Circular No. 8, August 31, 1942) and balata at ¢ a pound (Rubber Reserve Co. Circulars No. 11 and No. 12, September 30 and November 9, 1942, respectively) have not been announced. The New York Market price, however, of upriver fine on February 24, 1942, was quoted as 38¢ a pound and 43½¢ a pound for the washed and dried grade. The two grades of upriver coarse were 22¢ and 39¢, respectively; island fine, 38¢ and 43¢; Acre fine, 39¢ and 44¢; upper ball caucho, 22¢ and 39¢. The buying price for first-grade smoked sheets, whenever available from Latin America, has been set at 48¢ a pound, with other grades at comparable prices. These buying prices should encourage production and export to the United States.

It is the consensus of informed opinion that South and Central America offer no immediate sources of production that will provide a substantial portion of the rubber required for the war program and essential civilian needs this year or within the next few years. Several years will be required to develop abundant annual wild rubber collection and plantation production, but if the projected development is successful, a source of appreciable quantities of natural rubber will be available from nine to eleven thousand miles closer to United States ports than were Far Eastern supplies.

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## New Protective Coatings

New materials useful in replacing and conserving rubber for protective coatings for wood, metal, etc., which are resistant to acids, alkalies, alcohols, oils, greases, and fats, are being offered by Protective Coatings, Inc. Alkacite "A" is a black petroleum-base product which softens at 275° F. and melts at 500° F. and is particularly suitable where resistance to acids and alkalies is required. Synthetex, Type 50, a water-clear coating that bonds easily to metal, is flexible and is easily applied by dipping, drying, and baking at 275° F. This type, in addition to acid and alkali resistance, provides protection against petroleum solvents and animal or vegetable fats and is also resistant to temperature effects and mechanical abuse.

# Electric Cable Insulation from Synthetic Rubbers—II[1]


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IN THE first installment results of experiments dealing with the compounding and curing of synthetic rubbers in a 40% wire insulation using these rubbers in comparison with smoked sheets were reported. Tests on basic physical properties of the vulcanized compounds, including oxygen and air bomb aging tests, were included together with the effect on the original tensile and elongation of immersion of the stocks in organic solvents.

This second installment, which completes the article, will deal with properties which have a bearing on the suitability of the stocks for wiring insulation. In addition to tests on strictly electrical properties, results of special physical tests designed to determine the resistance of the insulation to the various types of mechanical, thermal, and chemical abuse to which it will be exposed during its normal service life are given.

As mentioned in the first installment,[2] since these synthetic rubbers were synthesized and compounded in an attempt to produce something as nearly like rubber as possible, it was only fair that they should be tested according to the methods which ordinarily apply to rubber. It appears that while the data presented tell us much about how the materials behave as *rubber*, it gives little of what we need to know, even of natural rubber, for the evaluation of their worth as electrical insulation.

If it is recognized that elastic dielectric materials are necessary, and if it is recognized also that they will have to be something other than natural rubber for the time being, it is fairly obvious that we need to devise new means for identifying the new substances for quality

[1] The opinions or assertions contained herein are the private ones of the writers and are not to be construed as official or reflecting the views of the Navy Department or the naval service at large.
[2] India Rubber World, Nov., 1942, pp. 157-62, 170.

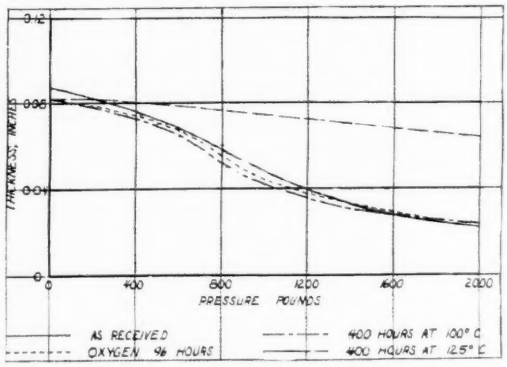



Fig. 6a. Compression. Natural Rubber

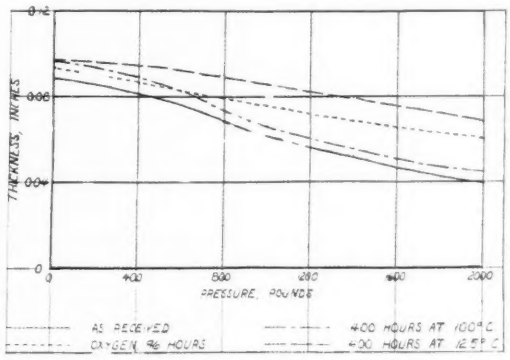



Fig. 6b. Compression. 25% Vistanex M

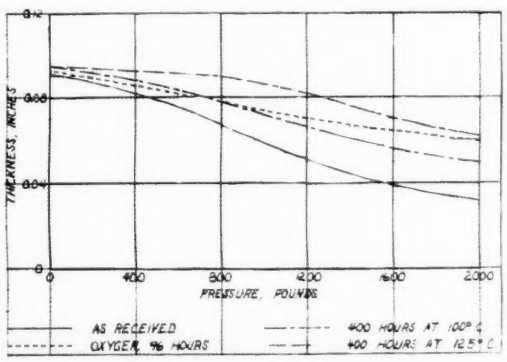



Fig. 6c. Compression. 50% Vistanex M

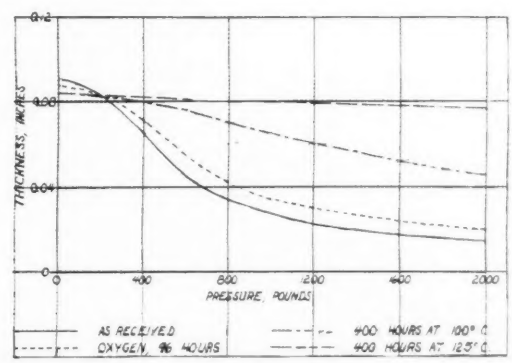



Fig. 6d. Compression. Neoprene GN

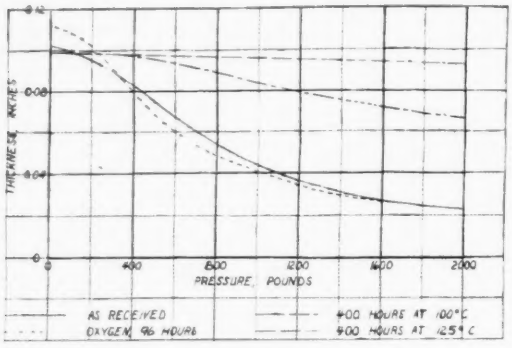



Fig. 6e. Compression. Neoprene I

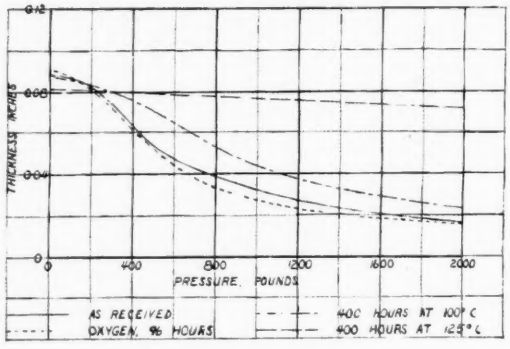



Fig. 6f. Compression. Hycar OR

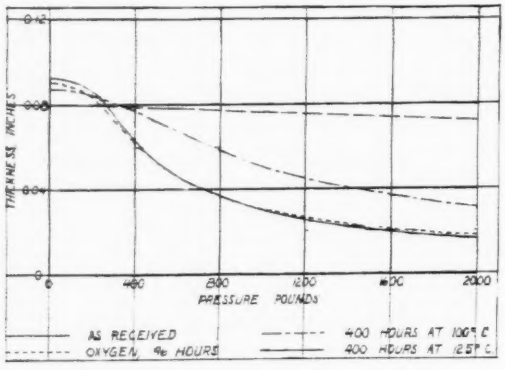



Fig. 6g. Compression. Chemigum I

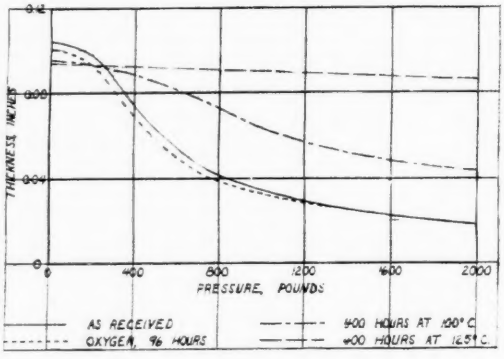



Fig. 6h. Compression. German Perbunan

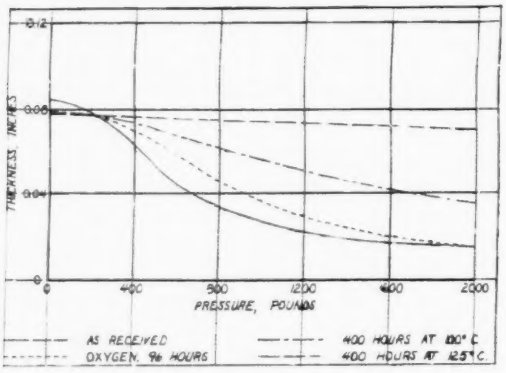



Fig. 6i. Compression. Domestic Perbunan

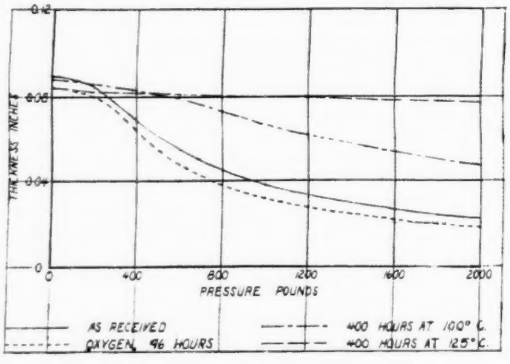



Fig. 6j. Compression. "Thiokol" RD

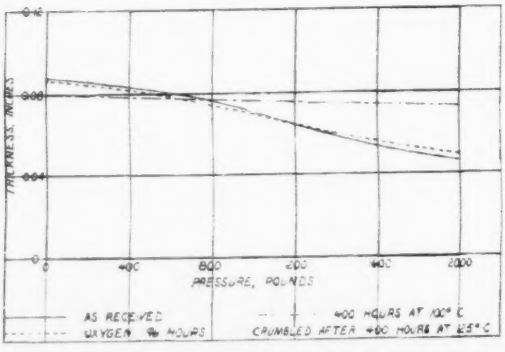



Fig. 6k. Compression. "Thiokol" F

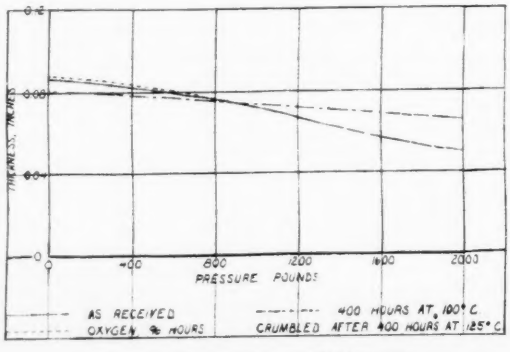



Fig. 6l. Compression. "Thiokol" FA

control purposes, and new methods of tests to measure (and even predict) their probable performance as electrical insulation. The long range objective, then, is *performance* as *dielectrics* and not merely *substitutes* for *rubber*.

Formulas for compounds used, processing and curing characteristics, and basic physical tests were given last month.[2] Results of other physical and electrical tests and a discussion of the present program at the Naval Laboratories for the development of test methods for wire insulation follow.

## Special Physical Tests

*Compression.* Compression tests were made on one-inch-square pieces in a Scott compression tester. The pressure was raised to 2,000 pounds and left for five minutes. It was then released, and the thickness of the sample was measured after a five-minute rest period to determine set. The compressibilities are shown in Figure 6, and the value of the set is shown in Table 8.

TABLE 8
Set after Compression, %

| Type | As Received | After Oxygen Bomb 96 Hrs. at 70° C. | After 400 Hrs. at 100° C. | After 400 Hrs. at 125° C. |
|---|---|---|---|---|
| Natural rubber | 1.8 | 0.2 | 2.2 | 1.7 |
| 25% Vistanex M | 3.0 | 2.7 | 4.6 | 10.2 |
| 50% Vistanex M | 13.6 | 4.1 | 13.3 | 38.1 |
| Neoprene GN | 8.0 | 6.7 | 2.5 | 1.0 |
| Neoprene I | 5.6 | 9.7 | 1.9 | .4 |
| Hycar OR | 10.0 | 9.1 | 4.7 | .6 |
| Chemigum I | 11.4 | 8.1 | 4.0 | .3 |
| German Perbunan | 9.5 | 3.8 | 1.8 | .3 |
| Domestic Perbunan | 11.6 | 9.4 | 3.8 | .3 |
| "Thiokol" RD | 3.3 | 7.8 | 1.8 | .6 |
| "Thiokol" F | 4.2 | 5.5 | 1.8 | * |
| "Thiokol" FA | 5.9 | 10.8 | 3.4 | * |

*These samples were easily crumbled and had no appreciable strength.

*Cutting.* Cutting tests were made on one-inch-square pieces of the material in a Scott compression tester using a one millimeter cutting edge. The pressure was increased until the sample failed. The results are given in Figure 7.

*Compression, Compression Set, and Cutting After Oxygen Bomb Aging.* Measurements of these properties were made after aging 96 hours in the oxygen bomb at 70° C. and 300 psi. Results are shown in Table 8 and Figures 6 and 7. It should be noted that set was determined after a fixed pressure rather than a fixed amount of compression. Most of the low values of set can be accounted for by the fact that the samples compressed very little.

*Compression, Compression Set, and Cutting After Air Oven Aging.* Measurements were made after aging 400 hours at 100° and 125° C. The results are given in Table 8 and Figures 6 and 7. Strips one inch wide were hung in the ovens at 100° and 125° C. At intervals the samples were removed, cooled to room temperature, and bent 180° around a diameter four times the sample thickness. The number of hours in the ovens found necessary to cause the strips to crack, when bent, is given in Table 9.

TABLE 9. AGING—HOURS TO CRACK WHEN BENT

| Type | 125° C. | 100° C. |
|---|---|---|
| Natural rubber | 215 | 1500 |
| 25% Vistanex M | 170 | 1500 |
| 50% Vistanex M | 170 | 1500 |
| Neoprene GN | 385 | 3780 |
| Neoprene I | 385 | 3780 |
| Hycar OR | 790 | 4000 |
| Chemigum I | 490 | 4000 |
| German Perbunan | 530 | 4000+ |
| Domestic Perbunan | 450 | 4000+ |
| "Thiokol" RD | 330 | 4000 |
| "Thiokol" F | 25 | 240 |
| "Thiokol" FA | 45 | 380 |

*Bonding.* To test for bonding of layers of the material at high temperatures, samples were built up consisting of

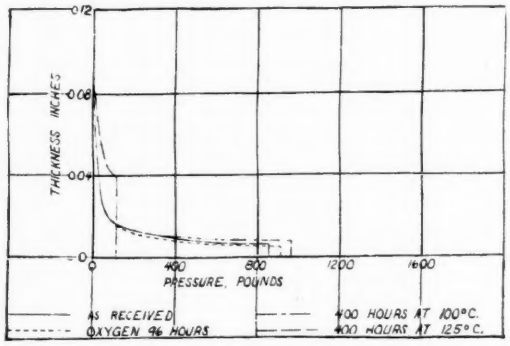



Fig. 7a. Cutting. Natural Rubber

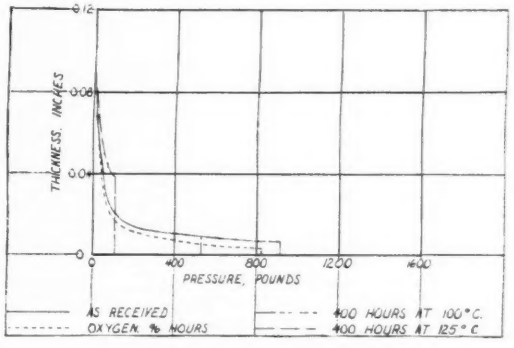



Fig. 7b. Cutting. 25% Vistanex M

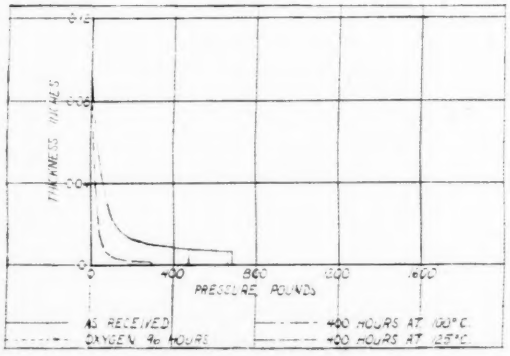



Fig. 7c. Cutting. 50% Vistanex M

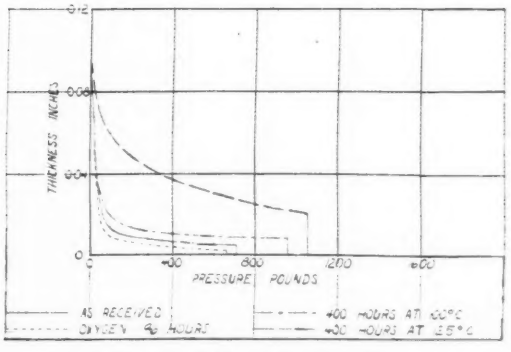



Fig. 7d. Cutting. Neoprene GN

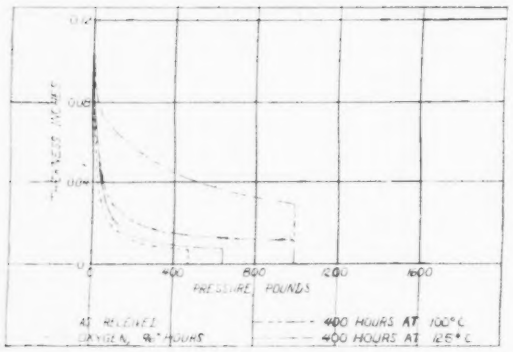



Fig. 7e. Cutting. Neoprene I

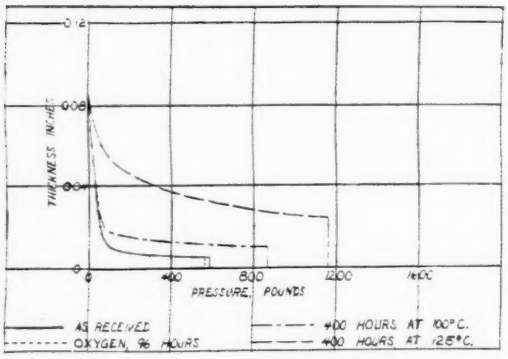



Fig. 7i. Cutting. Domestic Perbunan

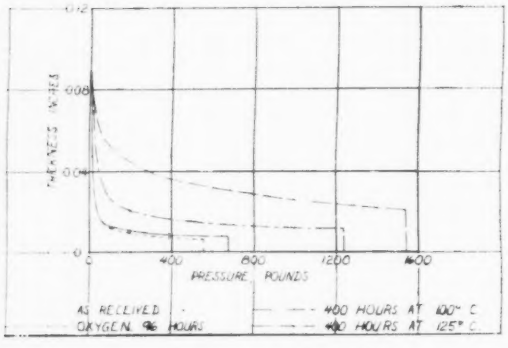



Fig. 7f. Cutting. Hycar OR

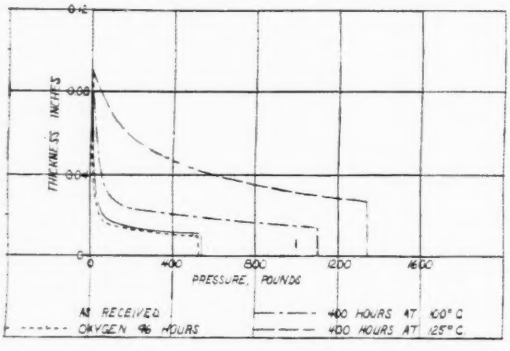



Fig. 7j. Cutting. "Thiokol" RD

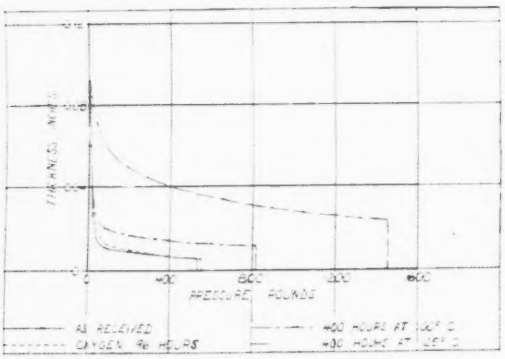



Fig. 7g. Cutting. Chemigum I

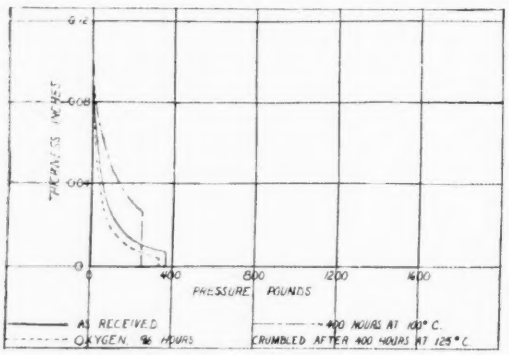



Fig. 7k. Cutting. "Thiokol" F

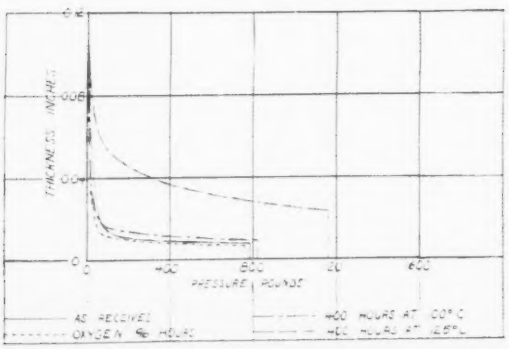



Fig. 7h. Cutting. German Perbunan

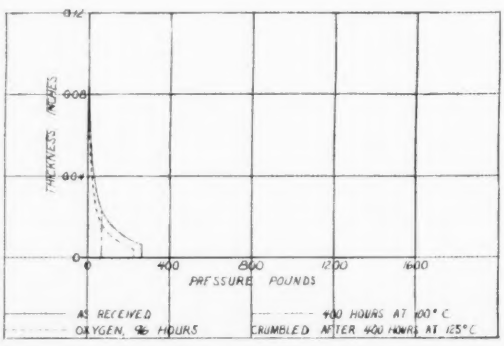



Fig. 7l. Cutting. "Thiokol" FA

a square of five mil copper, then a one-inch-square piece of slab, a second slab on top of that, and finally another square of copper. These were put under a pressure of 10 psi at 100° and 125° C. for 168 hours. The samples were then removed from the ovens, and the ease of separating rubber from copper and rubber from rubber was noted. The results are given in Table 10.

TABLE 10. BONDING

| Type | Slab to Slab | Slab to Copper |
|---|---|---|
| | 100° C. | |
| Natural rubber | Easy to separate | Chunks of rubber left on copper. |
| 25% Vistanex M | Easy to separate | Large chunks of rubber left on copper. |
| 50% Vistanex M | Hard to separate | Hard to separate. |
| Neoprene GN | Very hard to separate | Hard to separate. |
| Neoprene I | Very hard to separate | Hard to separate. |
| Hycar OR | Hard to separate | Easy to separate. |
| Chemigum I | Easy to separate | Hard to separate. |
| German Perbunan | Hard to separate | Hard to separate. |
| Domestic Perbunan | Easy to separate | Easy to separate. |
| "Thiokol" RD | Easy to separate | Easy to separate. |
| "Thiokol" F | Fused into one | Easy to separate. |
| "Thiokol" FA | Fused into one | Easy to separate. |
| | 125° C. | |
| Natural rubber | Small chunks pull out | Easy to separate. |
| 25% Vistanex M | Easy to separate | Easy to separate. |
| 50% Vistanex M | Hard to separate | Hard to separate. |
| Neoprene GN | Easy to separate | Easy to separate. |
| Neoprene I | Very hard to separate | Hard to separate. |
| Hycar OR | Hard to separate | Easy to separate. |
| Chemigum I | Easy to separate | Easy to separate. |
| German Perbunan | Hard to separate | Hard to separate. |
| Domestic Perbunan | Hard to separate | Easy to separate. |
| "Thiokol" RD | Easy to separate | Hard to separate. |
| "Thiokol" F | Fused into one | Easy to separate. |
| "Thiokol" FA | Fused into one | Easy to separate. |

*Abrasion Resistance.* The abrasion resistance was determined by three different methods, using the Du Pont abrader, the Bureau of Standards abrader, and an abrader employed by the Material Laboratory. The results are not in agreement, probably as a result of the difference in testing machine characteristics. See Table 11.

TABLE 11. ABRASION RESISTANCE

| Type | Du Pont Abrader: Volume Loss per Horsepower Hour Relative | Du Pont Abrader: Volume Loss per Hour Relative | Bureau of Standards Abrader: Revolutions per 0.1-Inch Wear Relative | Bureau of Standards Abrader: Volume Loss per 100 Revolutions Relative | Material Laboratory Abrader: Revolutions for 25% Reduction in Thickness | Material Laboratory Abrader: Revolutions for 50% Reduction in Thickness | Material Laboratory Abrader: % Reduction in Thickness after 200,000 Revolutions |
|---|---|---|---|---|---|---|---|
| Natural rubber | 100.0 | 100.0 | 100.0 | 100.0 | 6,000 | 10,600 | .... |
| 25% Vistanex M | 79.7 | 81.5 | 73.6 | 74.4 | 5,100 | 7,950 | .... |
| 50% Vistanex M | 58.1 | 57.6 | 47.2 | 43.3 | 2,250 | 3,900 | .... |
| Neoprene GN | 91.7 | 91.2 | 47.7 | 51.7 | 7,650 | 12,950 | .... |
| Neoprene I | 160.8 | 154.8 | 67.6 | 68.4 | .... | .... | 3.2 |
| Hycar OR | 150.6 | 135.6 | 94.9 | 97.8 | .... | .... | 4.4 |
| Chemigum I | 97.1 | 120.7 | 79.3 | 79.2 | 5,250 | 10,700 | .... |
| German Perbunan | 176.3 | 170.8 | 81.0 | 80.2 | 10,750 | 22,150 | .... |
| Domestic Perbunan | 133.2 | 170.0 | 95.9 | 97.1 | 4,950 | 8,750 | .... |
| "Thiokol" RD | 267.5 | 318.4 | 72.7 | 73.9 | .... | .... | 1.4 |
| "Thiokol" F | 60.5 | 93.2 | 36.5 | 37.6 | .... | .... | 4.5 |
| "Thiokol" FA | 49.9 | 79.9 | 28.7 | 36.1 | .... | .... | 4.7 |

*Flow.* The tendency of the materials to flow from between points of pressure at high temperatures was measured by placing small strips of the material in an oven on a flat base, applying 1,000 grams pressure to the sample by means of a 1/16-inch diameter pin rounded on the end to 1/32-inch radius, and noting the time necessary for the pin to penetrate the material and make contact with the platform below it. Twenty samples were timed at various temperatures up to 160° C. and the medium time reported for each temperature. The results for 50% Vistanex M, "Thiokol" F, and "Thiokol" FA are given in Table 12; the remaining types would not flow to the extent of allowing penetration through them in 3,600 seconds at 160° C.

*Flexing at Low Temperatures.* For this test one-by two-inch pieces of slabs were placed in refrigerators at + 3° C. and — 27° C. After one hour the samples were bent 180° around a diameter of four times the sample thickness and examined. None of the samples showed signs of cracking, but at — 27° C., Hycar OR was somewhat stiff, and Thiokol RD was very hard and stiff. Other samples were placed between layers of dry ice (— 83° C.) and likewise bent; all these samples broke in two.

TABLE 12. FLOW

| Type | Seconds to Penetrate at 70° C. | 80° C. | 100° C. | 130° C. | 140° C. | 150° C. | 160° C. |
|---|---|---|---|---|---|---|---|
| 50% Vistanex M | .... | .... | .... | 3600+ | 1050 | 130 | 70 |
| "Thiokol" F | 3600+ | 2400 | 420 | 62 | 30 | 17 | 7 |
| "Thiokol" FA | 3600+ | 2700 | 800 | 150 | 90 | 36 | 22 |

*Flexing Endurance.* Ability to withstand continued flexing was measured by placing one-inch strips on a flexing machine employed by the Material Laboratory which gives reverse bends 180° around 3/8-inch diameter rollers. The samples were under equal loads per unit thickness. They were periodically examined for cracks. The number of cycles required to produce surface cracks is given in Table 13.

TABLE 13. FLEXING ENDURANCE

| Type | No. Revolutions | Condition of Sample |
|---|---|---|
| Natural rubber | 200,000 | No apparent effect. |
| 25% Vistanex M | 124,000 | Many small cracks and some large. |
| 50% Vistanex M | 61,000 | Many small cracks. |
| Neoprene GN | 25,000 | Many small cracks. |
| Neoprene I | 200,000 | No apparent effect. |
| Hycar OR | 200,000 | No apparent effect. |
| Chemigum I | 190,000 | Few very small cracks. |
| German Perbunan | 149,000 | Many very fine cracks. |
| Domestic Perbunan | 200,000 | No apparent effect. |
| "Thiokol" RD | 200,000 | No apparent effect. |
| "Thiokol" F | 18,000 | Few small cracks. |
| "Thiokol" FA | 3,000 | Few small cracks. |

*Thermal Conductivity.* Thermal conductivity measurements were made on eight- by eight-inch slabs of the material. Mean temperatures of 70°, 130°, and 175° C. were used, with about 30° difference between hot and cold plates. The results are given in Table 14.

TABLE 14. THERMAL CONDUCTIVITY, BTU PER HOUR PER SQUARE FOOT PER INCH PER DEGREE F.

| Type | Mean Temperature: 70° F. | 130° F. | 175° F. | Flammability (Seconds): Ignition Time | Time to Burn to Top | Moisture Absorption % | Corrosion of Copper % Increase in Resistance: First Test | Second Test |
|---|---|---|---|---|---|---|---|---|
| Natural rubber | 1.18 | 1.17 | 1.19 | 51 | 20 | 0.93 | 0.3 | 1.4 |
| 25% Vistanex M | 1.26 | 1.29 | 1.37 | 51 | 35 | 0.70 | 90.0 | 23. |
| 50% Vistanex M | 1.18 | 1.14 | 1.28 | 59 | 29 | 0.48 | 1.1 | 1.3 |
| Neoprene GN | 1.24 | 1.24 | 1.34 | 52 | * | 0.51 | 0.5 | 1.9 |
| Neoprene I | 1.42 | 1.52 | 1.58 | 52 | 35 | 0.24 | 5.0 | 4.9 |
| Hycar OR | 1.18 | 1.24 | 1.29 | 60 | 54 | 0.68 | 0.8 | 0.6 |
| Chemigum I | 1.27 | 1.32 | 1.38 | 56 | 54 | 1.82 | 7.8 | 70. |
| German Perbunan | 1.20 | 1.23 | 1.29 | 60 | 70 | 0.52 | 2.1 | 4.6 |
| Domestic Perbunan | 1.13 | 1.24 | 1.28 | 63 | 50 | 1.05 | 1.1 | 1.5 |
| "Thiokol" RD | 1.28 | 1.35 | 1.42 | 51 | 48 | 1.63 | 0.3 | 0. |
| "Thiokol" F | 1.43 | 1.50 | 1.70 | 47 | 20 | 0.36 | 1.3 | 4.2 |
| "Thiokol" FA | 1.50 | 1.61 | 2.13 | 49 | 20 | 0.42 | 0.8 | 3.4 |

*No flame travel upward—traveled to bottom of sample.

*Flammability.* The ignition time and burning time of 18-inch samples of insulated wire were determined by the method employed at the Material Laboratory for testing electric cables.[3] The results are given in Table 14. All the compounds burned freely except Neoprene GN which apparently deposited a soot on the upper part of the sample preventing propagation of flame. The sample, however, burned slowly downward to the chuck. The residue left in all cases was brittle and easily crumbled.

*Moisture Absorption.* Moisture absorption was measured by drying three- by three-inch samples in desiccators with calcium chloride for three weeks. These were then weighed in weighing bottles, and this value was taken as the weight dry. The samples were then kept at 96% humidity for three weeks and again weighed. The difference was recorded as moisture absorption. The results are given in Table 14.

*Corrosion of Copper.* Corrosion effect on copper was measured by wrapping a six-inch piece of the insulated

[3] Bureau of Ships Ad Interim Specification 15C1 (INT) of July 1, 1942. [Cables, Electric, Insulated (Shipboard Use)].

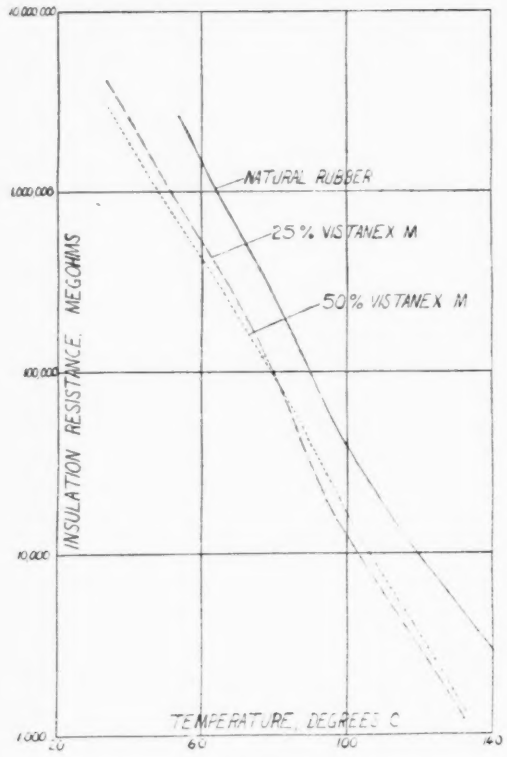



Fig. 8a

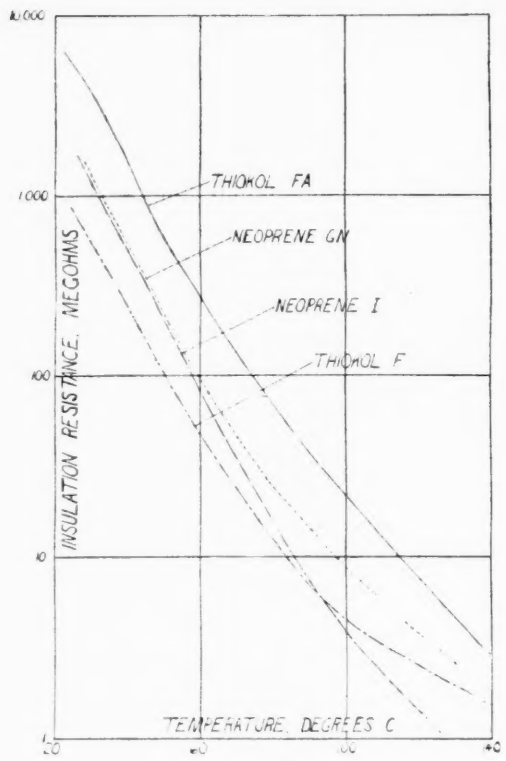



Fig. 8b

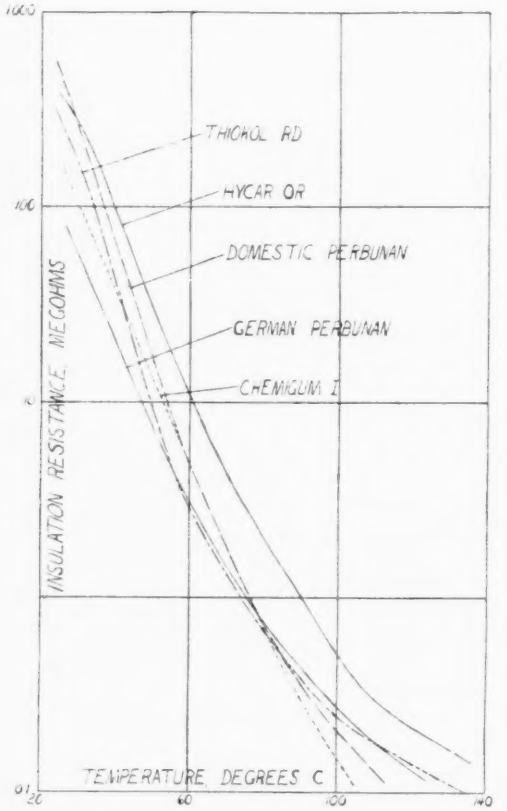



Fig. 8c

wire with about 27 inches of 0.005-inch diameter bare copper wire in a bifilar winding. Ends were soldered to heavy leads, and the samples placed into test tubes with the leads extending through the corks. A small amount of distilled water was placed in the bottom of each test tube. The test tubes were placed in a water bath at 26.5° C. until they were at a uniform temperature, and the resistance of each coil was measured. The resistance was measured at the same temperature after seven days in an oven at 70° C. The results are given in Table 14.

## Electrical Properties

*Dielectric Strength.* Three-inch slabs were conditioned for three weeks in a desiccator with calcium chloride. Other slabs were conditioned for the same period at 96% humidity. The samples were placed between two-inch diameter disk electrodes, submerged into transformer oil, and tested immediately for dielectric breakdown. The voltage was raised at the rate of 500 volts per second until failure. The average values are given in Table 15.

*Dielectric Constant and Power Factor.* Three-and-one-quarter-inch slabs were conditioned for three weeks in a desiccator with calcium chloride. Other slabs were conditioned for the same period at 96% humidity. Tinfoil electrodes coated with a thin layer of petrolatum were applied to top and bottom and rolled until all air was excluded. The bottom electrode was three inches in diameter, and the top electrode was 2⅝ inches surrounded by a ⅛-inch tinfoil guard ring, with a 1/16-inch gap between electrode and guard. The power factor and dielectric constant were measured on these samples at room temperature and 1,000 cycles. The results are given in Table 15.

*Insulation Resistance.* The insulation resistance at 180 volts was measured on the same samples immediately after the determination of dielectric constant and power

TABLE 15

| Type | Dielectric Strength Volts per Mil | | Dielectric Constant | | Power Factor | | Insulation Resistance Megohms at 180 Volts | |
|---|---|---|---|---|---|---|---|---|
| | Dry | 96% Humidity | Dry | 96% Humidity | Dry | 96% Humidity | Dry | 96% Humidity |
| Natural rubber | 498 | 482 | 3.35 | 4.24 | 0.0031 | 0.0446 | 2,000,000+ | 820,000. |
| 25% Vistanex M | 442 | 434 | 3.53 | 5.65 | .0016 | .0565 | 2,000,000+ | 2,000,000. |
| 50% Vistanex M | 442 | 429 | 3.51 | 4.66 | .0019 | .0728 | 2,000,000+ | 670,000. |
| Neoprene GN | 360 | 356 | 7.33 | 7.74 | .0177 | .0204 | 1,550 | 1,100. |
| Neoprene I | 330 | 340 | 10.2 | 12.2 | .0368 | .0418 | 880 | 400. |
| Hycar OR | 396 | 241 | 14.7 | 20.2 | .0233 | .137 | 200 | 10.4 |
| Chemigum I | 373 | 170 | 11.9 | 15.1 | .0729 | .227 | 140 | 7.1 |
| German Perbunan | 342 | 157 | 11.6 | 17.0 | .0454 | .155 | 86 | 10.5 |
| Domestic Perbunan | 379 | 243 | 11.0 | 14.8 | .0527 | .160 | 85 | 11.0 |
| "Thiokol" RD | 403 | 120 | 12.0 | 22.6 | .0723 | .130 | 158 | 26.5 |
| "Thiokol" F | 300 | 132 | 11.1 | 48.6 | .0081 | .316 | 580 | 10.5 |
| "Thiokol" FA | 287 | 180 | 9.05 | 32.4 | .0041 | .234 | 6,400 | 80. |

factor. In addition, desiccated samples with the electrodes applied in the same way were placed into an oven, and the insulation resistance was measured periodically while the temperature was raised from room temperature to 140° C. in one hour. The results are given in Table 15 and Figure 8.

It is evident that the three compound containing natural rubber have electrical properties far superior to those of the compounds containing no natural rubber, and that their superiority becomes still more pronounced in the presence of moisture. However it is not desired to condemn synthetic rubbers on the basis of the behavior of these particular compounds. It is conceivable that stocks compounded in some other way might possess much better characteristics.

## Discussion of Test Program

For electrical insulation it is required that any material worthy of the classification possess the following characteristics: satisfactory electrical properties, impact resistance, toughness, hardness, flexibility, and moisture resistance. Furthermore the insulation must retain its characteristics with a reasonable degree of permanence; it must not deteriorate rapidly through chemical change or physical deformation. Such deterioration will occur at a rate which depends on the temperature; on the degree of exposure to, or protection from air, moisture, and sunlight; and on whether the material is allowed to rest serene or is subjected to severe mechanical and electrical stresses. Since the rate of deterioration under any of these conditions is so sensitive to the temperature, J. B. Lunsford[4] has proposed using the following seven temperatures to characterize the permanence of an insulating material:

(1) The temperature above which marked loss of chemical stability begins.

(2) The temperature above which viscous deformation prevents successful use over a long period of time.

(3) The temperature above which viscous deformation from exposure to heat for a short time prevents its continued use.

(4) The temperatures above which long life, under more or less normal service conditions, will be sacrificed when the material is:

(a) Serene (thermally and electrically) and protected (from light, solvents, tension, flexing, abrasion, etc.).

(b) Serene and exposed.

(c) Stressed and protected.

(d) Stressed and exposed.

A plan for the development of test methods for the determination of these and other properties has been outlined by Lunsford in a series of articles discussing the ratings of electrical machinery[4] and is being pursued, currently, in the Naval Laboratories. In following out such a plan, step by step, the exact significance of the data presented herein is not the most important feature; the feature which is of primary importance and significance is the "questioning" frame of mind, the "experimental" approach, and the "massed" or cooperative attack. In this particular instance the number of collaborating authors and laboratories involved, as well as their geographic (yet not ideological) separation, is the best example of concerted action. The conclusions as yet reached, if any, are not deeply significant; but the methods of reaching for them are.

It is believed that by such a plan we may learn those things about insulating materials, including natural and synthetic rubber compounds, which will enable us to design *specialized insulations;* to handle more power with less weight and space by taking advantage of the best characteristics of each material. The benefits promised seem very much worthwhile.

Is it not probable that a similar approach, concerning the application of rubber for other than electrical purposes, might provide comparable benefits?


V-119-8/24 Drawn for Office of War Information

[4] *J. Am. Soc. Naval Engrs.*, 52, 1, 188, 369, 571 (1940); 53, 128 (1941).

# Study of Carbon Blacks in Natural and Synthetic Rubbers — III

I. Drogin[1]

EFFECT OF LAMP BLACK AND ACETYLENE BLACK IN NATURAL AND SYNTHETIC RUBBERS

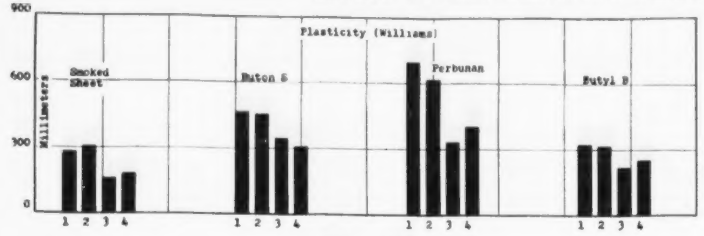



Fig. 58

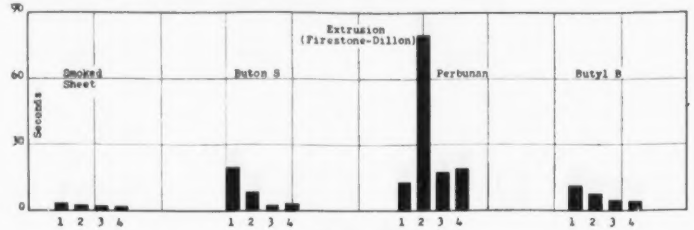



Fig. 59

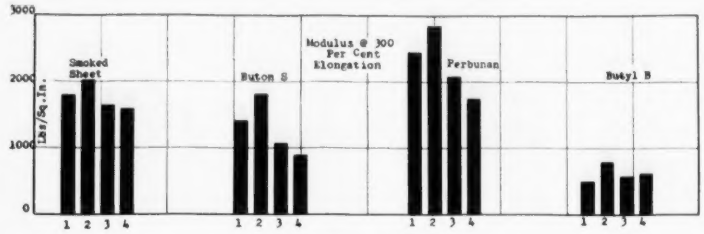



Fig. 60

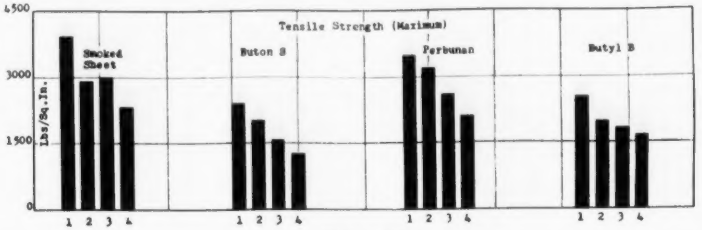



Fig. 61

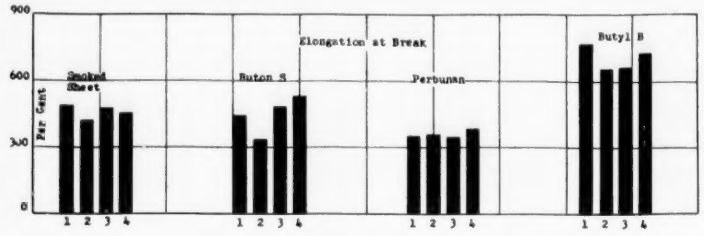



Fig. 62

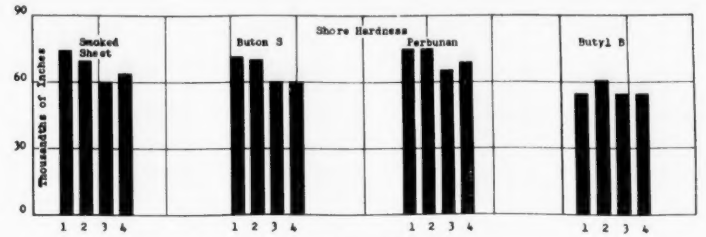



Fig. 63

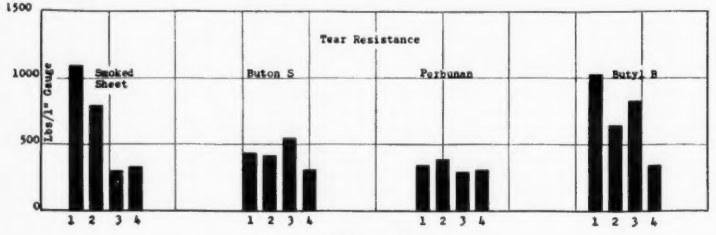



Fig. 64

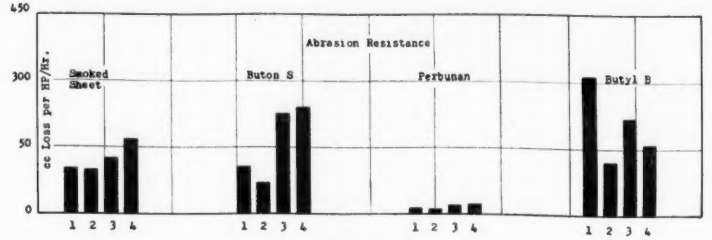



Fig. 65

1. Kosmobile 77 2. Acetylene Black 3. Kosmos 20 4. Lamp Black

EFFECT OF LAMP BLACK AND ACETYLENE BLACK IN NATURAL AND SYNTHETIC RUBBERS

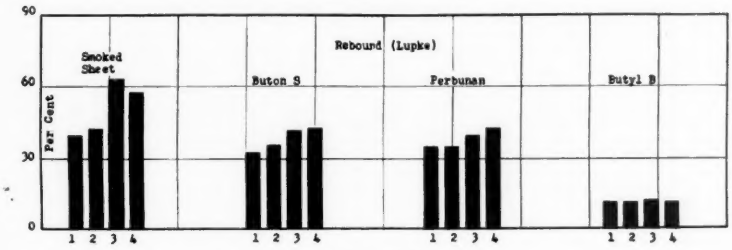



Fig. 66

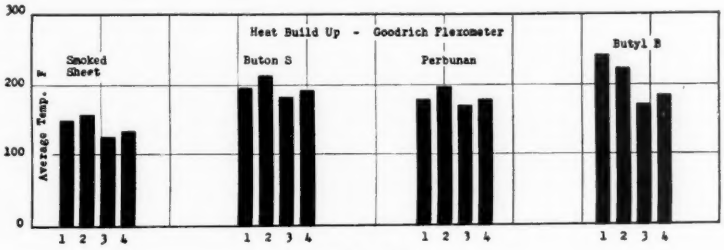



Fig. 67

1. Kosmobile 77
2. Acetylene Black
3. Kosmos 20
4. Lamp Black

THE first two installments[2] of this series have covered a comparison of natural rubber with ten synthetic rubbers in a pure gum compound; the effect of increased loadings of channel black in natural and three synthetic rubbers, a comparison of six different types of carbon black at a fixed loading in natural and three synthetic rubbers; the effect of five different types of black in increased loadings in natural and three synthetic rubbers; a study of channel black at a fixed loading in natural and ten synthetic rubbers; and a study of semi-reenforcing furnace black in natural rubber and seven synthetic rubbers.

This third and last installment reports the results of work on the effect of lamp black and acetylene black in comparison with channel black and semi-reenforcing furnace black at a fixed loading in natural rubber and three synthetic rubbers; the effect of three different types of black in a Buna S tread compound; and the effect of natural rubber or reclaim in three synthetic rubbers all loaded with 50 parts of channel black.

The lamp black has apparently the same effect in all of the rubbers as has the semi-reenforcing furnace black; while the acetylene black rates in several respects between the semi-reenforcing furnace black and the reenforcing channel black. The special reenforcing furnace black seems to give the best results in the Buna S tread compound. The blending of 80 parts of Buna S with 20 parts of smoked sheet or reclaim improves processibility, abrasion resistance, modulus, and hardness without too great a reduction of tensile strength, and elongation at break. The blending of 80 parts of Buna N with 20 parts of smoked sheet or reclaim improves processibility. It lowers somewhat the modulus, tensile strength, and heat build-up (in the reclaim blend). It increases the elongation at break and rebound. It appears inadvisable to blend Butyl B with either smoked sheet or reclaim. The resulting vulcanizates show extremely poor results due to lack of affinity between the rubbers.

The details of laboratory mixing, curing, and testing procedure used in all of this work were given at the end of the first installment under "Test Methods and Procedures Used."

As indicated in the various tables of test results for each of the items studied, the cure which produced the maximum tensile strength was used for comparison of the other properties in the tabular and graphical summations.

TABLE 27. PHYSICAL AND CHEMICAL CHARACTERISTICS OF THE BLACKS

| Designation | Kosmobile 77 | Kosmos 40 | Kosmos 20 | Lampblack B-5 | Acetylene Black |
|---|---|---|---|---|---|
| Process of Manufacture | Channel | Special Furnace | Furnace | Furnace | Special |
| Type | Soft | Re-enforcing | Semi-Re-enforcing | Semi-Re-enforcing | Re-enforcing |
| Color (Nigrometer)* | 90.3 | 97.0 | 103.1 | 109.7 | 95.0 |
| Surface area in square meters/gram | 82 | 45 | 29 | 23.0 | 85.0 |
| Oil absorption—c.c. | 112 | 84.1 | 75.0 | 105 | 260 |
| Volatile matter—% | 5.7 | 0.5 | 0.7 | 4.8 | 1.3 |
| D.P.G. adsorption—% | 12.9 | 1.7 | 3.0 | 2.1 | 5.4 |
| pH | 5.0 | 9.1 | 9.1 | 5.7 | 6.2 |
| Hygroscopicity—% | 3.6 | 0.2 | 0.3 | 1.3 | 0.10 |
| Max. vol. loading in 100 vol. smoked sheet | 79 | 85 | 110 | 107 | 75 |
| Extrusion (1:1) seconds† | none | 34.9 | 9.5 | 4 | 98 |

*The lower the reading the darker the black and relatively smaller the particle.
†Extrusion 1:1 is result on mixture of equal parts each type of carbon black and smoked sheet.

## Description of Blacks Used

The properties of most of the blacks used have been given in the previous installments, but the physical and chemical characteristics of all the blacks mentioned in this installment are listed in Table 27. Rubber-grade lamp black in this country is currently made by a furnace process from crude oil, gas oil, or creosote oil. As shown in the table, lamp black is comparable with the semi-reenforcing carbon black, Kosmos 20/Dixie 20, in particle size as judged from surface area measurements, volume loading in rubber, and processing characteristics. It is slightly lower in accelerator adsorption, but slightly more acid (pH) than the semi-reenforcing type blacks. The raw material used in the manufacture of acetylene black (Shawinigan) is acetylene gas from refuse carbide. The black is made either by thermal decomposition, explosion with air at 50 to 100 pounds' pressure, or by burning. Acetylene black appears closely related to channel-process black

[1] Director of research, United Carbon Co., Charleston, W. Va.
[2] India Rubber World, Sept., 1942, pp. 561-69; Oct., 1942, pp. 42-49.

EFFECT OF THREE TYPES OF BLACK IN A BUNA S TREAD COMPOUND

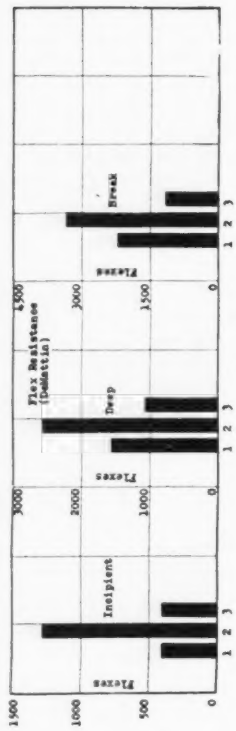



Fig. 69

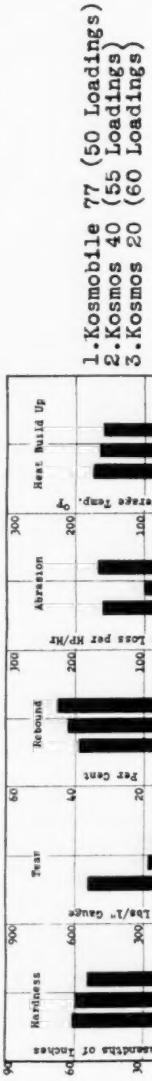



Fig. 70

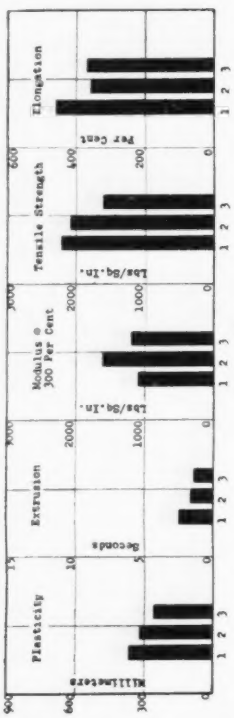



Fig. 68

in state of sub-division as estimated from surface area measurements and intensity of color, acidity (pH), volume loading in rubber, and processing. It is more like a furnace-type black made from natural gas with respect to volatile matter content, and its accelerator adsorption rates between that of channel black and semi-reenforcing type of carbon black.

TABLE 28. FORMULATION—LAMP BLACK AND ACETYLENE BLACK

| | Smoked Sheet | Buna S* or Buna N† | Butyl B |
|---|---|---|---|
| Rubber | 100 | 100 | 100 |
| Zinc oxide | 5 | 5 | 5 |
| Stearic acid | 2 | 1.5 | 3 |
| Pine tar | — | 1.5 | — |
| Paraflux | — | 1.5 | — |
| Altax | 0.65 | 1.25 | — |
| Tuads | — | — | 1 |
| Sulphur | 2.85 | 2 | 1.5 |
| Black | 60 | 60 | 60 |
| | 170.5 | 172.75 | 170.5 |
| Press Cure | 292° F. | 292° F. | 307° F. |

*Buton S. †Perbunan.

TABLE 29. DETAILED TEST DATA—LAMP BLACK AND ACETYLENE BLACK

| Type of Black | Kosmobile 77 | Acetylene Black | Kosmos 20 | Lamp Black |
|---|---|---|---|---|
| **Plasticity, Mm (Williams)*** | | | | |
| Smoked sheet | 283 | 305 | 160 | 180 |
| Buton S (Buna S) | 469 | 457 | 346 | 305 |
| Perbunan (Buna N) | 700 | 617 | 330 | 407 |
| Butyl B | 323 | 315 | 220 | 253 |
| **Extrusion, Seconds (Firestone-Dillon)†** | | | | |
| Smoked sheet | 3.2 | 2.4 | 2.0 | 1.8 |
| Buton S (Buna S) | 19.6 | 8.9 | 2.7 | 3.2 |
| Perbunan (Buna N) | 12.8 | 80 | 17.6 | 18.9 |
| Butyl B | 11.0 | 7.7 | 5.2 | 4.7 |
| **Modulus at 300%‡** | | | | |
| Smoked sheet | 1800 | 2025 | 1605 | 1600 |
| Buton S (Buna S) | 1425 | 1825 | 1075 | 900 |
| Perbunan (Buna N) | 2450 | 2840 | 2080 | 1750 |
| Butyl B | 500 | 800 | 575 | 610 |
| **Tensile Strength‡** | | | | |
| Smoked sheet | 3950 | 2900 | 3000 | 2325 |
| Buton S (Buna S) | 2400 | 2015 | 1585 | 1275 |
| Perbunan (Buna N) | 3490 | 3200 | 2590 | 2100 |
| Butyl B | 2550 | 2000 | 1850 | 1660 |
| **Elongation at Break‡** | | | | |
| Smoked sheet | 490 | 425 | 480 | 460 |
| Buton S (Buna S) | 445 | 340 | 485 | 530 |
| Perbunan (Buna N) | 350 | 360 | 345 | 385 |
| Butyl B | 765 | 650 | 660 | 725 |
| **Shore Hardness‡** | | | | |
| Smoked sheet | 74 | 70 | 60 | 64 |
| Buton S (Buna S) | 71 | 70 | 60 | 60 |
| Perbunan (Buna N) | 75 | 75 | 65 | 69 |
| Butyl B | 55 | 61 | 55 | 55 |
| **Tear Resistance‡¶** | | | | |
| Smoked sheet | 1091 | 794 | 305 | 328 |
| Buton S (Buna S) | 437 | 422 | 550 | 305 |
| Perbunan (Buna N) | 348 | 384 | 290 | 308 |
| Butyl B | 1030 | 641 | 830 | 312 |
| **Abrasion Resistance‡§** | | | | |
| Smoked sheet | 191 | 99 | 140 | 167 |
| Buton S (Buna S) | 104 | 60 | 226 | 240 |
| Perbunan (Buna N) | 12 | 8 | 19 | 23 |
| Butyl B | 310 | 121 | 218 | 158 |
| **% Rebound‡#** | | | | |
| Smoked sheet | 40 | 43 | 63 | 58 |
| Buton S (Buna S) | 33 | 36 | 42 | 43 |
| Perbunan (Buna N) | 35 | 35 | 40 | 43 |
| Butyl B | 11 | 11 | 12 | 11 |
| **Heat Build up (Goodrich Flexometer)—Average Temp. °F.‡ (*a, b*)** | | | | |
| Smoked sheet | 149 | 158 | 126 | 133 |
| Buton S (Buna S) | 197 | 213 | 183 | 192 |
| Perbunan (Buna N) | 179 | 199 | 171 | 180 |
| Butyl B | 243 | 224 | 172 | 186 |
| **Heat Build up (Goodrich Flexometer)—% Compression** | | | | |
| Smoked sheet | 3.4 | 4.4 | 1.8 | 2.3 |
| Buton S (Buna S) | 8.8 | 5.2 | 3.8 | 5.0 |
| Perbunan (Buna N) | 3.8 | 2.1 | 2.2 | 2.2 |
| Butyl B | 20.0 | 11.1 | 4.2 | 8.1 |
| **Heat Build up (Goodrich Flexometer)—% Set** | | | | |
| Smoked sheet | 5.2 | 4.0 | 2.8 | 3.2 |
| Buton S (Buna S) | 5.6 | 4.0 | 3.8 | 4.0 |
| Perbunan (Buna N) | 4.0 | 2.4 | 2.0 | 2.4 |
| Butyl B | 22.0 | 10.0 | 6.0 | 5.6 |
| **% Shrinkage (*c*)** | | | | |
| Smoked sheet | 2.9 | 1.4 | 4.3 | 3.8 |
| Buton S (Buna S) | 3.8 | 4.8 | 4.8 | 8.7 |
| Perbunan (Buna N) | 5.8 | 2.4 | 19.2 | 2.9 |
| Butyl B | 4.8 | 1.4 | 10.6 | 6.7 |
| **Electrical Resistance (*d*)** | | | | |
| Smoked sheet | 2x10. | 3 | 1x10. | 3x10. |
| Buton S (Buna S) | 66x10. | 10 | 13x10. | 2x10. |
| Perbunan (Buna N) | 23x10. | 19 | 28x10. | 4x10 |
| Butyl B | 4.5x10. | 3 | 164 | 158 |

*Notes:*
* Williams plastometer, at 70° C.
† Firestone-Dillon plastometer, 15 lbs. pressure.
‡ For cure which produced maximum tensile strength.
¶ Winkelmann test, crescent shaped piece.
§ Grasselli Abrader.
# Lupke-type machine.
(*a*) Goodrich flexometer, stroke 0.150-inch, load 147.5 lbs., r.p.m. 1800.
(*b*) Average of 30 minute cycle.
(*c*) Shrinkage of a standard dumbbell test piece.
(*d*) Measured with Volt Ohmyst Jr., calculated to ohms-cm³.

## Lamp Black and Acetylene Black Study

Lamp black, acetylene black, semi-reenforcing furnace black, Kosmos 20/Dixie 20, and soft channel black, Kosmobile 77/Dixiedensed 77, were compounded according to the formulation given in Table 28. Lamp black, generally speaking, has the same effect in natural and synthetic rubbers as a semi-reenforcing furnace-process carbon black. These two types of blacks, as indicated in Tables 29 and 30, appear with few exceptions to be very closely related in each particular rubber. The exceptions noted are those for resistance to tear in the synthetic rubbers Buna S and Butyl. See Figure 64. Lamp black also appears to give results slightly lower in tensile strength and higher in heat build up since it runs somewhat hotter than the semi-reenforcing black in all the rubbers tested. See Figures 58 through 67 for graphical illustrations of results of all tests made.

Also, as shown in Tables 29 and 30 and illustrated in Figures 58 through 67, acetylene black rates in several respects between the channel-process black, Kosmobile 77/Dixiedensed 77, and the semi-reenforcing type carbon black, Kosmos 20/Dixie 20. The comparisons shown in Table 30 are made with values of 100 assigned to the results obtained with the channel-process black, Kosmobile 77/Dixiedensed 77. The processing of the acetylene black is more like that of a channel black; in fact it is a little harder. It is also higher in heat build up in all the rubbers except Butyl B. The modulus of acetylene black is higher than that of channel process black, and tensile strength is somewhat lower in all of the rubbers. The tear resistance is lower in all cases with the exception of Perbunan. Acetylene black is definitely superior to the other types of blacks tested in electrical conductance.

## Different Blacks in a Buna S Tread Compound

The object of this comparison is to observe the effect of a channel-process black, Kosmobile 77/Dixiedensed 77, a semi-reenforcing type of black, Kosmos 20/Dixie 20, and a special furnace-type black, Kosmos 40/Dixie 40, in a Buna S tire tread compound. In the formulation of these compounds shown in Table 31, the channel-process black was used at 50 parts loading; the semi-reenforcing type at 60 parts; and the special furnace-process black at 55 parts on 100 of rubber.

The detailed test results for the best cures of each stock are indicated in Table 32. Figures 68, 69, and 70 show these results graphically.

The relation of the results obtained for the two furnace blacks, Kosmos 20/Dixie 20 and Kosmos 40/Dixie 40, as compared with those for the channel process black, Kosmobile 77/Dixiedensed 77, is summarized in Table 33. All values for the channel black are each assigned a rating of 100. We find that the Kosmos 40/Dixie 40, even though in 10% higher loading, gives best results with respect to ease of processing, better reenforcement, better resistance to abrasion and flexing, higher resiliency, and lower heat build up than the channel black. The advantage of the higher loading can be appreciated in view of its usefulness in replacing some of the rubber.

The advantages gained by the use of a semi-reenforcing

TABLE 30. SUMMARY OF TEST DATA—LAMP BLACK AND ACETYLENE BLACK

| | Plasticity | Extrusion | Modulus | Tensile | Elongation | Hardness | Tear | Abrasion | Rebound | Heat Build up | Elec. Res[3], Ohms-Cm[3] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Smoked sheet | | | | | | | | | | | |
| Kosmobile 77 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | $10^6$ |
| Acetylene black | 93 | 133 | 113 | 73 | 87 | 95 | 73 | 102 | 107 | 10° F. | 3 |
| Kosmos 20 | 177 | 160 | 92 | 76 | 98 | 81 | 28 | 72 | 157 | —23° F. | $10^7$ |
| Lamp black | 157 | 178 | 89 | 59 | 94 | 86 | 30 | 61 | 145 | —16° F. | $10^3$ |
| Buton S (Buna S) | | | | | | | | | | | |
| Kosmobile 77 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | $10^7$ |
| Acetylene black | 103 | 220 | 126 | 84 | 76 | 99 | 97 | 151 | 109 | 16° F. | 10 |
| Kosmos 20 | 136 | 726 | 76 | 66 | 109 | 85 | 126 | 46 | 127 | —14° F. | $10^9$ |
| Lamp black | 154 | 613 | 63 | 53 | 119 | 85 | 70 | 43 | 130 | — 5° F. | $10^9$ |
| Perbunan (Buna N) | | | | | | | | | | | |
| Kosmobile 77 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | $10^7$ |
| Acetylene black | 114 | 16 | 116 | 92 | 103 | 100 | 110 | 150 | 100 | 20° F. | 19 |
| Kosmos 20 | 212 | 73 | 85 | 75 | 99 | 87 | 83 | 63 | 114 | — 8° F. | $10^7$ |
| Lamp black | 172 | 68 | 71 | 60 | 110 | 92 | 89 | 52 | 123 | 1° F. | $10^8$ |
| Butyl B | | | | | | | | | | | |
| Kosmobile 77 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | $10^6$ |
| Acetylene black | 103 | 143 | 160 | 79 | 85 | 111 | 62 | 256 | 100 | —19° F. | 3 |
| Kosmos 20 | 147 | 212 | 115 | 73 | 86 | 100 | 81 | 142 | 109 | —71° F. | 164 |
| Lamp black | 128 | 234 | 122 | 65 | 95 | 100 | 33 | 196 | 100 | —57° F. | 158 |

TABLE 31. FORMULATION—BUNA S TREAD COMPOUND

| | Dixiedensed 77 Kosmobile 77 | Dixie 40 Kosmos 40 | Dixie 20 Kosmos 20 |
|---|---|---|---|
| Buton S | 100 | 100 | 100 |
| Zinc oxide | 5 | 5 | 5 |
| Stearic acid | 2.5 | 2.5 | 2.5 |
| Pine tar | 1.3 | 1.3 | 1.3 |
| Wool grease | 2.4 | 2.4 | 2.4 |
| Bardol | 2.4 | 2.4 | 2.4 |
| Agerite powder | 0.8 | 0.8 | 0.8 |
| Sunproof | 1.7 | 1.7 | 1.7 |
| Santocure | 1.4 | 1.4 | 1.4 |
| Sulphur | 1.8 | 1.8 | 1.8 |
| Black | 50 | 55 | 60 |
| | 169.3 | 174.3 | 179.3 |
| Press cure | 280° F. | 280° F. | 280° F. |

TABLE 32. DETAILED TEST DATA—BUNA S TREAD COMPOUND

| | Dixiedensed 77 Kosmobile 77 | Dixie 40 Kosmos 40 | Dixie 20 Kosmos 20 |
|---|---|---|---|
| Black loadings | 50 | 55 | 60 |
| Plasticity, mm* | 362 | 318 | 260 |
| Extrusion, seconds† | 2.4 | 1.7 | 1.4 |
| Modulus @ 300%‡ | 1100 | 1625 | 1200 |
| Tensile strength (maximum)‡ | 2215 | 2080 | 1615 |
| Elongation at break‡ | 460 | 360 | 370 |
| Shore hardness‡ | 61 | 60 | 55 |
| % tensile depreciation¶ | 12 | 4 | 35 |
| Tear resistance‡§ | 545 | 282 | 242 |
| Abrasion resistance‡# | 162 | 100 | 168 |
| % rebound‡ (*a*) | 39 | 42 | 45 |
| % shrinkage (*b*) | 6.3 | 4.8 | 9.6 |
| Flex resistance, flexes (*c*) | | | |
| Incipient cracking | 405 | 1275 | 405 |
| Deep cracking | 1550 | 2525 | 1050 |
| Final break | 2210 | 3380 | 1150 |
| Heat Build up‡ (*d*) | | | |
| Average temp. °F. (*e*) | 175° | 166° | 161° |
| % compression | 6.2 | 2.5 | 1.3 |
| % set | 6.0 | 3.2 | 3.2 |
| Electrical resistance (*f*) | $3.2 \times 10^8$ | $1.6 \times 10^5$ | $6.8 \times 10^8$ |

TABLE 33. SUMMARY OF TEST DATA—BUNA S TREAD COMPOUND

| Black | Dixiedensed 77 Kosmobile 77 | Dixie 40 Kosmos 40 | Dixie 20 Kosmos 20 |
|---|---|---|---|
| Black Loadings | 50 | 55 | 60 |
| Plasticity | 100 | 114 | 139 |
| Extrusion | 100 | 141 | 171 |
| Modulus | 100 | 148 | 109 |
| Tensile | 100 | 94 | 73 |
| Elongation | 100 | 78 | 80 |
| Hardness | 100 | 98 | 90 |
| Tear resistance | 100 | 52 | 44 |
| Abrasion resistance | 100 | 162 | 96 |
| Flex resistance | 100 | 153 | 52 |
| Rebound | 100 | 108 | 115 |
| Heat build up | 100 | —9° F. | —14° F |

* Williams plastometer, at 70° C.
† Firestone-Dillon plastometer, 15 lbs. pressure.
‡ For cure which produced maximum tensile strength.
¶ Aged 24 hrs. in oxygen bomb @ 80° C. and 300 lbs. oxygen pressure.
§ Winkelmann test, crescent shaped piece.
# Grasselli abrader.
(*a*) Lupke-type machine.
(*b*) Shrinkage of a standard dumbbell test piece.
(*c*) DeMattia machine, stroke 3-inch, r.p.m. 300.
(*d*) Goodrich flexometer, stroke 0.150-inch, load 147.5 lbs., r.p.m. 1800.
(*e*) Average of 30 minute cycle.
(*f*) Measured with Volt Ohmyst Jr., calculated to ohms-cm.[3]

## EFFECT OF SMOKED SHEET OR RECLAIM IN SYNTHETIC RUBBER

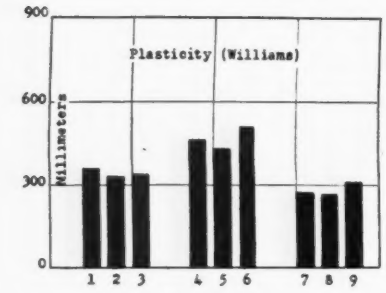



Fig. 71

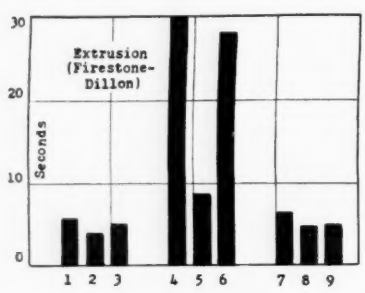



Fig. 72

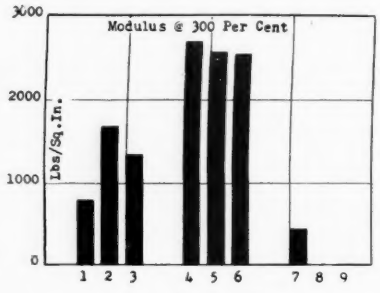



Fig. 73

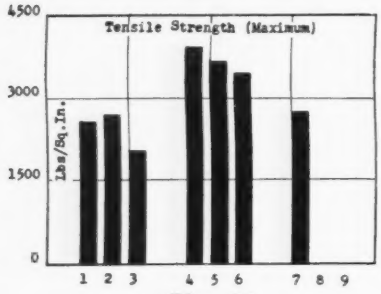



Fig. 74

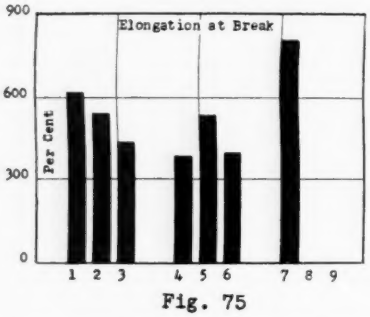



Fig. 75

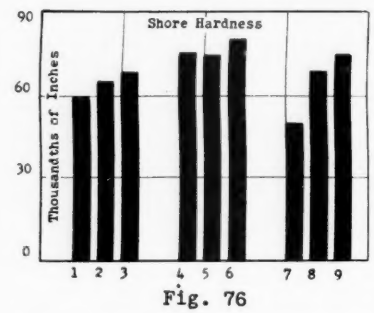



Fig. 76

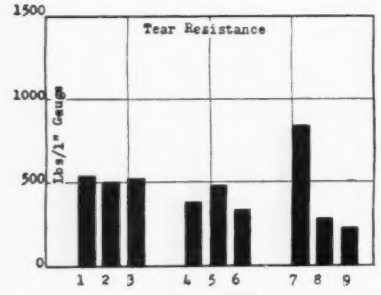



Fig. 77

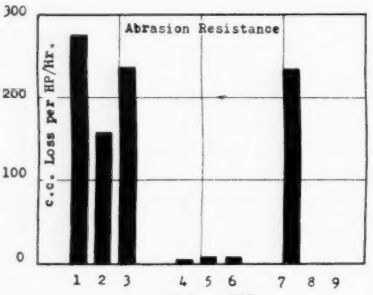



Fig. 78

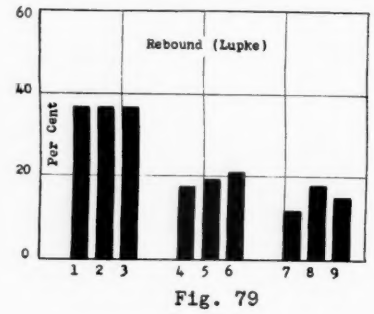



Fig. 79

1. Buna S (Buton S)
2. Buton S and Smoked Sheet
3. Buton S and Reclaim
4. Buna N (Hycar OR)
5. Hycar OR and Smoked Sheet

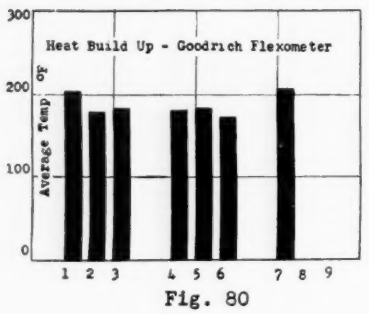



Fig. 80

6. Hycar OR and Reclaim
7. Butyl B
8. Butyl B and Smoked Sheet
9. Butyl B and Reclaim

TABLE 34. FORMULATION—SMOKED SHEET OR RECLAIM IN SYNTHETIC RUBBER

| | Buna S* or Buna N† | Blend of Buna S or Buna N with Smoked Sheet | Blend of Buna S or Buna N with Reclaim |
|---|---|---|---|
| Buna S or Buna N | 100 | 80 | 80 |
| Smoked sheet | — | 20 | — |
| Whole tire reclaim | — | — | 20 |
| Zinc oxide | 5 | 5 | 4.5 |
| Stearic acid | 1 | 2 | 1.8 |
| Pine tar | 3 | 3 | 2.75 |
| Paraflux | 3 | 3 | 2.75 |
| Altax | 1.25 | 1.25 | 1.1 |
| Sulphur | 2 | 2.3 | 1.97 |
| Kosmobile 77 | 50 | 50 | 43.4 |
| | 165.25 | 166.55 | 158.27 |
| Press Cure | 292° F. | 292° F. | 292° F. |

| | Butyl B | Blend of Butyl B with Smoked Sheet | Blend of Butyl B with Reclaim |
|---|---|---|---|
| Butyl B | 100 | 80 | 80 |
| Smoked sheet | — | 20 | — |
| Whole tire reclaim | — | — | 20 |
| Zinc oxide | 5 | 5 | 4.92 |
| Stearic acid | 3 | 3 | 3 |
| Tuads | 1 | 1 | 1 |
| Sulphur | 1.5 | 1.5 | 1.46 |
| Kosmobile 77 | 50 | 50 | 43.4 |
| | 160.5 | 160.5 | 153.78 |
| Press Cure | 307° F. | 307° F. | 307° F. |

*Buton S.
†Hycar OR.

black, Kosmos 20/Dixie 20, from the standpoint of processing are readily offset by its low reenforcement. Therefore, even though it can be used in higher loadings than either the channel or the special furnace type, it must be ruled out as a complete replacement for either of these two types of blacks in tread stock formulation.

### Smoked Sheet or Reclaim in Synthetic Rubbers

Having established the behavior of different types of blacks in the different rubbers, the thought arose that perhaps a blend of synthetic rubber with either natural or reclaimed rubbers would improve the processing conditions and provide a product with more desirable properties than those obtained with the synthetic rubbers alone. Accordingly Buna S, Buna N, and Butyl B, respectively, were blended with natural rubber or reclaimed rubber in the proportions of 80 parts of the synthetics and 20 parts of the natural rubber or reclaim; each stock compounded with the channel-process black, Kosmobile 77/Dixiedensed 77. The formulation used in these blends is shown in Table 34. The detailed test results obtained are given in Table 35 and illustrated in Figures 71 through 80.

It was found that the blending of 80 parts of Buna S with 20 parts of smoked sheet or whole-tire reclaim improves processibility, abrasion resistance, modulus, and hardness. It brings about lower elongation and also lowers the heat build up. It apparently has no effect on the rebound.

The blending of 80 parts of Buna N with 20 parts of smoked sheet or reclaim gives the following results: the processing is improved, particularly in the case of the smoked sheet blend, and lower reenforcement is obtained. The heat build up in the case of the reclaim blend is lowered; elongation and rebound is increased.

It appears inadvisable to blend Butyl B with either smoked sheet or reclaimed rubber. Although the processibility of the blends is improved, the resulting vulcanizates show extremely poor results due to lack of affinity between the rubbers.

TABLE 35. DETAILED TEST DATA—SMOKED SHEET OR RECLAIM IN SYNTHETIC RUBBER

| | Buna S | Buna S and Smoked Sheet | Buna S and Reclaim | Buna N | Buna N and Smoked Sheet | Buna N and Reclaim | Butyl B | Butyl B and Smoked Sheet | Butyl B and Reclaim |
|---|---|---|---|---|---|---|---|---|---|
| Plasticity, mm* | 364 | 335 | 357 | 465 | 443 | 522 | 278 | 270 | 315 |
| Extrusion, seconds† | 5.8 | 4.0 | 5.1 | 31.0 | 8.8 | 28.2 | 6.5 | 4.9 | 5.0 |
| Modulus @ 300%‡ | 800 | 1675 | 1340 | 2700 | 2560 | 2550 | 450 | — | — |
| Tensile strength‡ | 2590 | 2710 | 2050 | 4050 | 3700 | 3520 | 2800 | 350 | 200 |
| Elongation at break† | 620 | 545 | 425 | 385 | 540 | 400 | 805 | — | — |
| Shore hardness† | 60 | 65 | 69 | 76 | 75 | 80 | 55 | 70 | 75 |
| Tear resistance†¶ | 540 | 508 | 524 | 381 | 485 | 334 | 832 | 285 | 230 |
| Abrasion resistance†§ | 277 | 158 | 238 | 4 | 8 | 8 | 235 | — | — |
| % rebound†# | 37 | 37 | 37 | 18 | 20 | 21 | 12 | 18 | 15 |
| Heat build up† (*a*) | | | | | | | | | |
| Average temp. °F. (*b*) | 204° | 180° | 183° | 183° | 185° | 174° | 207° | — | — |
| % Compression | 10.6 | 6.1 | 7.9 | 3.9 | 7.2 | 4.8 | 14.3 | — | — |
| % set | 9.6 | 4.0 | 6.0 | 4.0 | 5.2 | 2.0 | 14.2 | — | — |
| Electrical resistance (*c*) | $8\times10^9$ | $2\times10^9$ | $17\times10^9$ | $11\times10^9$ | $3\times10^9$ | $18\times10^9$ | $3.2\times10^6$ | $16\times10^9$ | $2.6\times10^9$ |

* Williams plastometer, at 70° C.
† Firestone-Dillon plastometer, 15 lbs. pressure.
‡ For cure which produced maximum tensile strength.
¶ Winkelmann test, crescent shaped piece.
§ Grasselli abrader.
# Lupke-type machine.
(*a*) Goodrich flexometer, stroke 0.150-inch, load 147.5 lbs., r.p.m. 1800.
(*b*) Average of 30-minute cycle.
(*c*) Measured with Volt Ohmyst Jr., calculated to ohms-cm.[3]

## 1941 Accident Rates in the Industry[1]

THE rubber industry ranked seventh in 1941 in injury experience in a list of 31 major occupations. Because such information might be useful to the enemy in estimating production, employe and man-hour figures, lost time and the number of injuries, as well as plant identification in connection with current records were omitted from the current report of the National Safety Council. The working time, however, was the largest ever reported, although the number of plants was less than that for 1940.

The following facts, based on data from 44 rubber factories, cover the important phases of the industry's accident experience last year:

1. Frequency[2] rates averaged 8.10 reportable injuries per million hours worked—47% below the all-industry average of 15.39.

2. Rubber company severity[3] rates averaged 0.62-day disability per thousand hours worked—60% below the average of 1.53 for all industries.

3. The industry's 1941 frequency rate was 13% higher than the 1940 average. The general increase in this rate was only 8%.

4. Severity rates averaged 2% lower than in 1940. This reduction was less than the average decrease of 8% for all industries.

5. Cumulative reductions in injury rates since 1926 were 70% for frequency and 49% for severity. Progress in frequency has exceeded the average reduction for industry as a whole. Improvement in severity, however, has been slightly less than the general decline.

6. Large plants had the lowest 1941 frequency rates, averaging 8.97. Small plants, however, continued to have the lowest severity rates, averaging 0.31.

7. Large units made the only improvement from 1940 in either injury rate—a reduction of 10% in severity. Both injury rates soared in small plants.

8. Injury rates were highest in tire manufacturing plants, averaging 9.75 for frequency and 0.78 for severity.

9. Only footwear manufacturing plants reduced frequency rates in comparison with 1940. Severity rates decreased only in mechanical rubber goods manufacturing.

10. Reports covering 62 fatalities and permanent partial disabilities show that the principal unsafe conditions involved in the accidents were hazardous working methods and processes such as poor housekeeping, followed by inadequate guarding and worn, broken, poorly designed tools and equipment. The principal personal causes were disobedience, abstraction, and other improper attitudes.

11. The Providence, R. I., plant of the United States Rubber Co. holds the best all-time-no-injury record in the industry—5,688,369 man-hours.

[1] Abstracted from "1941 Accident Rates in the Rubber Industry", National Safety Council, Inc., 20 N. Wacker Drive, Chicago, Ill.

[2] Injury frequency rate is the number of reportable injuries per million man-hours of exposure.

[3] Injury severity rate is the number of days lost as the result of reportable industries, per thousand man-hours of exposure. This rate includes arbitrary charges for permanent disabilities and deaths, in accordance with the standard scale.

# EDITORIALS

## Holiday Greetings

WITH this issue which precedes the holiday season, INDIA RUBBER WORLD and its staff extend to its readers sincere best wishes for the enjoyment of a Merry Christmas and fervent hope for a victorious and successful New Year. In spite of the inevitable difficulties of operation during the war period, the rubber and allied industries can contemplate the birth of a new rubber industry which promises far to outstrip the old one in the scope of its activities and the possibilities for new and profitable enterprise when victory is secured.

## "For Victory—Unity!"

JUST about three months have elapsed since the report of the Baruch Rubber Survey Committee was made public and generally accepted as offering the best recommendations for the solution of our rubber problems. During the last month there has been increasing evidence that various organized minority groups both in and out of Congress are again proceeding in the usual manner to attempt to further their own interests in denial of any real acceptance of the recommendations.

Previous criticism of the confused approach to and lack of definite action on the rubber problem by the government is entitled to credit for obtaining the appointment of the Rubber Survey Committee. Now that the Committee's report has been made and the recommendations are being carried out, continued fault-finding reveals these critics in their true light and removes the cloak of their earlier expressed sole interest in the national welfare.

The report had prompt approval from the highest official sources. The Presidential executive order of September 17, "Providing for the Coordination and Control of the Rubber Program," confirmed the appointment of W. M. Jeffers as Rubber Director to assume control of the program in "all of its phases" and also approved the other recommendations of the Committee. Now that such action has been taken, it should certainly not be exposed continually to hindrance of the type currently apparent.

At first we had the attempts of the cotton bloc in Congress to delay the decision to expand facilities for the production of high-tenacity rayon yarn for heavy-duty combat tires for the Army. Realizing the primary necessity of speed in making a decision of this type based on the facts available at the time, Mr. Jeffers ordered the program put into effect. If and when comparative data on cotton and rayon yarn become available, and if cotton can be made to do as good a job as rayon for this purpose, it will undoubtedly be used. The important point is that the demands of the war cannot wait.

We had also the determined opposition of other groups to nation-wide gasoline and mileage rationing which is scheduled to go into effect on December 1. Statements to the effect that there was no element of rubber conservation in the proposed nation-wide gasoline rationing and that a good Congressional investigation certainly seems justified indicate a startling lack of appreciation of the real facts of the case.

In direct contrast, L. D. Tompkins, assistant deputy rubber director in charge of operations, reported before the House Interstate Commerce Committee on November 24 that the present tonnage of our crude rubber stockpile and the present rate of importation and consumption showed the extreme importance of greater conservation.

The President, in identical letters to Mr. Jeffers and Mr. Henderson made public on November 26, referred to the Baruch committee report's often quoted statements that: "We find the existing situation to be so dangerous that unless corrective measures are taken immediately this country will face both a military and civilian collapse—in rubber we are a have-not nation."

The President then went on to say; and this should be noted carefully by opponents of the rubber program:

"Since then the situation has become more acute, not less. Since then our military requirements for rubber have become greater, not smaller. Since then many tons of precious rubber have been lost through driving not essential to the war effort. We must keep every pound we can on our wheels to maintain our wartime transportation system."

Nation-wide gasoline and mileage rationing has now become a fact. The outlook for the future may be best summed up by referring again to the Baruch report:

"If by the end of 1943 the actual production of synthetic rubber measures up to schedule and if synthetic rubber can be used readily, or if military or export needs for rubber prove less than now anticipated, it should be possible to relax the restrictions somewhat on civilian driving. Before this can be done, however, there must be an assurance that between 100,000 and 150,000 tons of Buna S rubber a year will be available, in excess of military needs, for civilian purposes."

As a further suggestion to aid in dealing with present and future opposition to the administration of the rubber program, the Rubber Director's office should consider giving widespread publicity to the following final paragraph of the digest of the Baruch report.

"FOR VICTORY—UNITY!"

"In drawing up these recommendations the Committee has sought to find a basis upon which the entire nation can go forward together, uniting our energies against the enemy instead of dissipating them in domestic wrangling. It appreciates that it is asking the public to make sacrifices because of mistakes that have been made and for which the people are not to blame. But wrong things done in the past cannot be cited as a defense for making mistakes in the future. The war demands that we do these things. Victory can be won no other way."

# What the Rubber Chemists Are Doing

## Egloff Discusses Synthetics

IN A testimonial dinner given in his honor, October 23, by the New York Chapter of American Institute of Chemists at the Chemists Club in New York, Gustav Egloff spoke on "Wartime Chemicals from Natural Gas" and in the course of his address devoted considerable time to a discussion of synthetic rubbers in this connection. Dr. Egloff, who is director of research for Universal Oil Products Co., Chicago, Ill., and a member of the Permanent Council for World Petroleum Congress, stated that 100,000 barrels a day of normal butane are available from natural gas, which, if used for butadiene production, would satisfy all our requirements for this material for our present synthetic rubber program. He also declared the acetylene from natural gas for synthetic rubber production (particularly neoprene) might be obtained at a lower cost than by the electro-chemical method of producing calcium carbide and that raw materials for the manufacture of "Thiokol" could also be obtained from this same source.

Synthetic rubber, in general, he said, should be considered at least equivalent to natural rubber, and he emphasized that some synthetic rubbers have been used for some time where their superior resistance to gasoline, oil, and other chemicals is an advantage. The speaker pointed out that the chemist's goal is not necessarily to synthesize a duplicate of natural rubber, but to duplicate whatever properties natural rubber has that are needed for special purposes and to add new properties where required. Citing certain special advantages that have shown up already with synthetic rubber tire treads such as less side-slipping on hills, he said that with the tremendous research effort being concentrated on synthetic rubber he felt that eventually synthetic rubber tires superior to our best natural rubber tires will be produced. It was his belief that synthetic rubber was here to stay, and that it will be a permanent industry after the war. An eventual price of 15¢ a pound for synthetic rubber was considered possible.

In another address before the National Farm Chemurgic Council, Third Mid-American Chemurgic Conference for Agriculture, Industry and Science at Cincinnati, O., November 17, Dr. Egloff spoke on "Synthetic Rubber from Petroleum." In this talk he pointed out that it was of much greater importance to the oil industry that it get back its market for gasoline than it was to maintain control of the production of synthetic rubber raw materials such as butadiene which required a relatively small quantity of petroleum. The oil industry has a vital interest in seeing that cars are provided with tires and would therefore do everything possible to see synthetic rubber made from alcohol, or coal, or any other raw material from which it could be made more quickly than from petroleum, he said. Dr. Egloff reviewed the properties and methods of production of the major types of synthetic rubber and also methods of production of the raw materials required for their production and then went on to state his belief that synthetic rubber after the war will be a major industry capable of supplying the entire country with products meeting its every need. Whether the raw materials come from petroleum, coal, or alcohol still remains to be worked out during an economy not based on war, he stated. In conclusion, he declared that should the petroleum industry continue in its present role of the chief raw material supplier for synthetic rubber, it will serve in that respect as it has served in supplying other petroleum products to be a chief assistant in making agriculture easier, more fruitful, and more profitable.

## Thiogen—Sulphur in Solution

AID in the distribution of sulphur in Buna N synthetic rubber compounds with the resulting improvement in uniformity and level of stress-strain properties is obtained by the use of a new product called Thiogen, as reported by the Wilmington Chemical Corp., 10 E. 40th St., New York, N. Y. This product is described as a stabilized solution of active sulphur in an unsaturated hydrocarbon, the latter being capable of covulcanization with rubber and synthetic rubber. Two grades of Thiogen are now available commercially, Thiogen 6 and Thiogen 10, containing 6% and 10% of active sulphur, respectively. The proper sulphur content and storage stability of Thiogen are assured through a recently developed process of manufacture and exact analytical control. By use of this new product, erratic results obtained previously with Buna N compounds in which the sulphur was dispersed by ordinary compounding means are eliminated, and highly desirable maximum and uniform stress-strain properties are obtained.

## Haydenite Replaces Rubber in Army Raincoats

A NEW synthetic coating material for fabrics using polyvinyl butyral, the plastic formerly used in large amounts for automobile safety glass, as a base has been announced by The Stanley Chemical Co., East Berlin, Conn. This is the third company to announce the development of formulations of this plastic to replace rubber for fabric coating; previous announcements had been made by Monsanto Chemical Co., St. Louis, Mo., and E. I. du Pont de Nemours & Co., Inc., Wilmington, Del.

When the manufacture of automobiles was stopped, there were on hand large quantities of polyvinyl butyral used in the production of safety glass. There was also the problem of how to replace rubber in the raincoats, life-belts, tarpaulins, hospital sheets, pontoons, and scores of other items necessary for our armed forces.

Major Frank M. Steadman, of the Research and Development Section of the Quartermaster Depot at Philadelphia, is credited with the idea that here was a case where a surplus created by the war might satisfy a shortage and the problems cancel out. As a result of laboratory and plant development work, another new synthetic coating material, named Haydenite for Stanley's technical director, E. M. Hayden, is now available. Better than rubber in many ways, cheaper than some previous coatings, and easier to apply, this new-type material bids well to replace rubber for all requirements involving the use of waterproof fabrics for some time.

## Technical Microscopy in the Rubber Industry

THIS paper not only describes the importance of the microscope in determining particle size and shape, but also covers its applications in the solution of other problems which ordinarily are not considered to lie in the field of microscopy.

The author first points out the importance of differentiating between determination of average particle size and particle-size distribution by diameter and by weight and shows how by means of the weight method, the evaluation of the degree of reenforcement to be obtained with a given sample of carbon black can be correctly interpreted and to agree with the actual test results on the finished rubber stock.

For examination of particles below the resolving power of the ordinary microscope (less than 0.20-micron) a novel method employing the principle of the comparison microscope is used. By means of the comparison of the same amounts of an unknown and a standard pigment in rubber using the same thickness of sample and illuminated with the same condenser under the same objective, comparative values may be obtained much more rapidly and accurately than by the laborious method of particle size counting and measuring of the unknown pigment dispersed in a Nujol rubber cement.

The invaluable assistance of the microscope in making possible a quick positive solution in problems of factory processing and correlation of physical properties and service performance is shown by examples of the analysis of difficulties involving surface contamination, blooming, chemical reactions, and aging of various rubber stocks. Photomicrographs are used to illustrate the solution of the problems.

[1] R. P. Allen, *Ind. Eng. Chem.* (Anal. Ed.), Sept., 1942, pp. 740-50.

# A. C. S. Rubber Division Activities

## Akron Group Meeting

THE fall meeting of the Akron Group, Division of Rubber Chemistry, A. C. S., was held at the Akron City Club, Akron, O., November 6, and was attended by about 200 including a goodly number from out-of-town. The program feature was an interesting talk on "Shell Loading" by Lt. Waynett Kuhn, of the Ravenna Ordnance Plant, who described the methods of loading various types of shells and displayed the various kinds of gun and mortar missiles. He then showed a movie on the manufacture of three-inch anti-aircraft shells.

W. J. Krantz, secretary-treasurer, announced at the meeting that owing to the excellent condition of the Group treasury, dues would be suspended for the year 1943.

During the dinner preceding the meeting excellent entertainment was provided by the Marion Miller All-Girl Orchestra.

## Synthetics before L. A. Group

APPROXIMATELY 130 members and guests attended the November 3 meeting of the Los Angeles Group, Division of Rubber Chemistry, A. C. S., at the Mayfair Hotel, Los Angeles, Calif. The program included addresses on three synthetic rubbers. Edward Cunningham, of the Chemical Products Division of Stanco Distributors, Inc., New York, N. Y., spoke on Perbunan, followed by Walter Boswell, Dow Chemical Co., Midland, Mich., who discussed "Thiokol", and Herman Jordan, E. I. du Pont de Nemours & Co., Inc., Wilmington, Del., who spoke on neoprene. A question-and-answer forum on synthetic rubber in general was conducted by J. M. Robbins (Goodrich), A. F. Pond (U. S. Rubber), and Phil Drew (Goodyear).

The selections of the nominating committee for next year's officers were unanimously approved, and the following were elected to serve: chairman, Charles J. Roese (Goodyear); vice chairman, L. F. MacDonald (formerly with Goodrich); secretary, C. M. Reinke (Reinke, Hiller & Amende); treasurer, Curtis R. Wolter (U. S. Rubber); directors, John Hoerger (Schrader), E. H. Lewis (Western Insulated Wire), and A. L. Pickard (Braun Corp.).

Winners of prizes during the evening were Phil Drew, Herman Jordan, and J. M. Jordan, who won War Stamps, given by the Group, worth $10.00, $5.00, and $3.75, respectively. Stanco Distributors donated a special prize of a $25 War Bond, won by Wilfred Bergs. T. Kirk Hill won a combination lamp and radio, a gift of W. B. Woodmansee for Toyad Corp. Bill Shawger, for Rubbercraft Corp., donated table favors consisting of rulers, and Western Insulated Wire, Inc., through E. H. Lewis, contributed favors of cigarettes and matches.

The Group will hold a theatre party next month, but there will be no supper meetings in December or January.

## New York Group Christmas Fete

THE executive committee of the New York Group, Rubber Division, A. C. S., has decided to hold the annual Christmas party this year as usual. The affair will be held at the Building Trades Club, 2 Park Ave., New York, N. Y. on December 18, starting at 6:30 o'clock. Entertainment will feature a presentation of "30 minutes of streamlined magic" by Walter Grote, of United Carbon Co., and will also include the usual distribution of prizes. The only business to be brought before the meeting will be the election of officers for the coming year. Tickets are $2.50 each for members of the Group and $5 for non-members and guests. They may be secured from Peter P. Pinto, secretary-treasurer, c/o *Rubber Age*, 250 W. 57th St., New York, N. Y.

## Buffalo Group Christmas Party

THE Buffalo Group, Rubber Division, A. C. S., will hold its third annual Christmas party December 16 at the Hotel Westbrook, Buffalo, N. Y., at 7:00 p.m. After dinner, election of officers will be held. The remainder of the program will consist entirely of entertainment. Reservations may be sent to Howard L. Wiley, secretary-treasurer, c/o U. S. Rubber Reclaiming Co., Inc., P. O. Box 365, Buffalo, N. Y.

## Chicago Christmas Party

THE annual Christmas party of the Chicago Group, Rubber Division, A. C. S., will be held December 18 in the Terrace Casino of the Morrison Hotel, Chicago, Ill. The affair will consist of a dinner dance and floor show. The committee in charge of the program consists of Chairman James P. Sheridan, New Jersey Zinc Sales Co.; Co-chairman Robert C. Gunther, Inland Rubber Co.; Daniel Siefer, Diamond Wire & Cable Co.; George Gates, Victor Mfg. & Gasket Co.; J. T. Adams, Sears Roebuck & Co.; and Wm. Crumpler, George Mephan Co.

## A.S.T.M. Specifications for Rubber Sheath Compound

A NEW emergency specification for rubber sheath compound was recently issued by the American Society for Testing Materials, 260 S. Broad St., Philadelphia, Pa., to cover standard requirements for a compound where extra abrasion resistance is not required. The specification, entitled Emergency Specifications for Rubber Sheath Compound for Electrical Insulated Cords and Cables Where Extreme Abrasion Resistance Is Not Required—(ES-6), covers a durable, vulcanized rubber compound suitable for use as the outside covering or sheath on insulated electrical cords and cables, and in its physical requirements must have a minimum tensile strength of 1800 psi.; elongation at rupture of 350 min.; set in two-inch gage length, 3/8-inch maximum; and a tensile strength after 48 hours in oxygen bomb test of min. 1400 psi.

## Detroit Group Plans

THE Detroit Rubber & Plastics Group, Inc., will hold its Christmas dinner-meeting at 6:30 p.m., December 11, in the Jade Room, Hotel Detroit Leland, Detroit, Mich. The principal speaker will be Monty Clark, former personnel director, United States Rubber Co., who will discuss his new duties as Detroit district director of the War Manpower Commission.

## Montreal Groups to Meet

THE Rubber & Plastics Division of the Society of Chemical Industry, Montreal Section, held a meeting November 13 at which A. E. Byrne, plastics engineer of the Canadian General Electric Co., discussed the chemical derivation of plastics and described in detail the glyptal resins which his company manufactures. A large audience attended. A joint meeting with the Montreal Section, S. C. I., is planned for December 16 at the Ritz Carlton Hotel. H. I. Cramer, Sharples Chemicals, Inc., Philadelphia, Pa., will talk on "Synthetic Rubber."

## Ontario Group Meets

THE Ontario Rubber Group has scheduled its next meeting for December 3 at the University of Toronto, Toronto, Ont., Canada. The speaker will be I. Drogin, director of research, United Carbon Co., Charleston, W. Va.

## Provisional pH Standards[1]

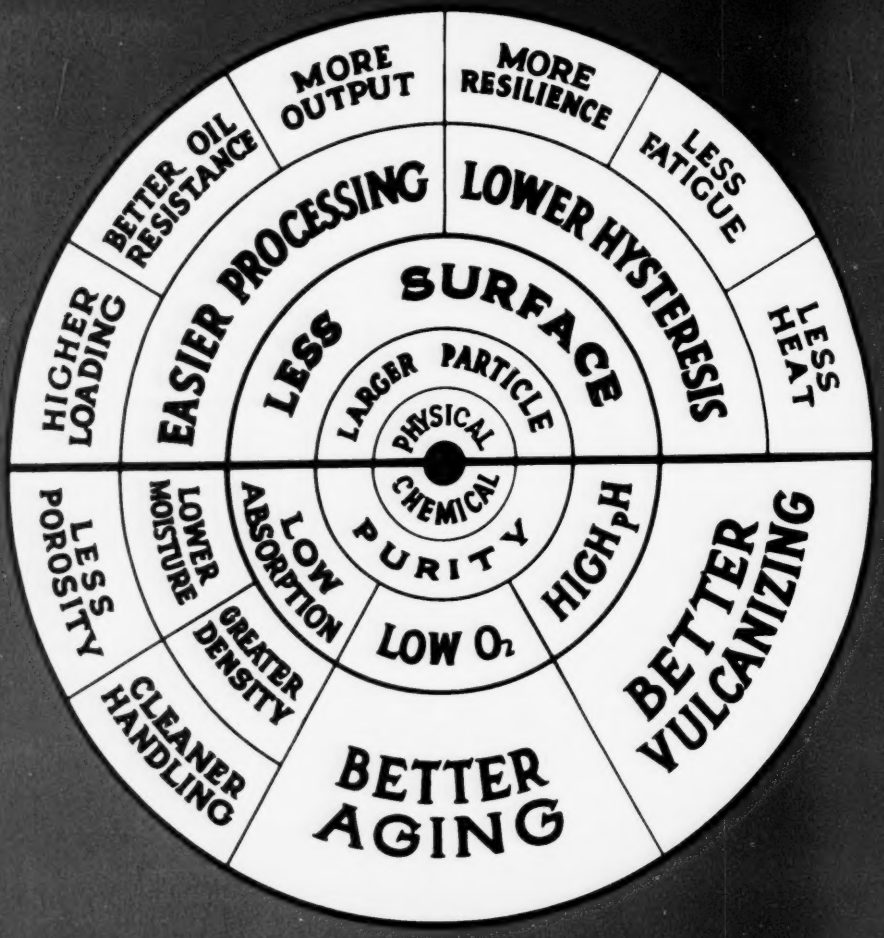
THE efficiency and the rapidity of many processes involved in preparing commercial products depend upon the accurate control of the acidity or alkalinity of aqueous solutions. Roger G. Bates, Walter J. Hamer, George G. Manov, and S. F. Acree, of the pH Standards Section, National Bureau of Standards, who are engaged in devising and improving methods for accurately measuring acidity, designated by a number called the "pH value", have recommended 17 standard solutions of a wide range of known acidities for the use of those workers who must determine pH with precision. As explained in the September *Journal of Research* (RP1495), these standards are for adjusting to a common basis equipment now in use for pH determinations and for the control of acidity in laboratory reactions and industrial processes. Directions are given for the preparation of the solutions, and the pH values at 20°, 25°, and 30° C. are listed.

[1] Abstracted from *Tech. News Bulletin*, Sept., 1942, p. 71.

# *The Advantages of*

# FURNEX

## in NATURAL and SYNTHETIC Rubber

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# UNITED STATES

## Commercial Production of Chemurgic Rubber—Agripol

The first commercial production in the world of synthetic rubber from soya beans has been announced by Henry Reichhold, chairman of the board of Reichhold Chemicals, Inc., Detroit, Mich., one of the largest manufacturers of synthetic resins. Called Agripol, this chemurgic rubber was made possible through initial research begun by the Northern Regional Research Laboratories of the United States Department of Agriculture at Peoria, Ill., which in the Spring of 1942 succeeded in demonstrating that a rubber-like product (Norepol) could be made by the polymerization of the fatty acids extracted from domestic vegetable oils. During the succeeding months Reichhold chemists worked cooperatively with the Peoria staff and accomplished the task of reducing previous laboratory experiments to commercial practice, and the synthetic substitute for natural rubber known as Agripol was the result.

In certain of its physical properties, Agripol is inferior to natural rubber, particularly where high tensile strength and resistance to sever abrasion are desirable properties.

It is not offered, therefore, at the present time, as a substitute for rubber in the manufacture of tires. In the field of molded products where high tensile strength and elongation are not essential, Agripol is expected to prove a wartime and peacetime boon. In flexibility at low temperatures, it is the comparative equivalent of natural rubber, and in aging tests it behaves in a superior fashion to natural rubber, it is reported. In compounding, the customary fillers used in compounding natural rubber are employed, such as sulphur, carbon black, zinc oxide, and an appropriate plasticizer. It is stated that this substitute rubber is adaptable to existing equipment in rubber manufacturing plants and that it vulcanizes at about the same temperature. Its use for innumerable mechanical goods products of a critical nature has been demonstrated to a sufficient degree to absorb Reichhold's entire contemplated 1943 output, with a resultant possible saving of a considerable amount of natural rubber.

Present production capacity for making Agripol in Reichhold plants is approximately a quarter of a million pounds a month, to be increased to two million pounds by February, 1943, and to 4,000,000 pounds monthly by May, 1943, provided raw materials are allocated for the purpose and permission is granted by the War Production Board for a modest amount of additional equipment.

Principal raw materials employed in the production of this substitute come from the farm—soya bean oil and ethyl alcohol, although only a small percentage of ethyl alcohol is used. The fatty acids extracted from soya bean oil, when polymerized with ethylene glycol (obtained through the dehydration of ethyl alcohol), produce Agripol.

### Tubeless Tires Being Tested

The Petroleum Industry War Council, Washington, D. C., on November 9, at its meeting at the Palmer House, Chicago, Ill., following a test demonstration of tubeless tires by their originator, John B. McGay, of Tulsa, Okla., requested that its transportation committee arrange immediately with each district committee to give the tires a 30-day test in all parts of the country under all types of operating conditions.

The process of converting to tubeless tires is simple, Mr. McGay explained. Merely remove the tire and tube from the ring; clean the head of the casing and the inside of the rim; patch any leaks in the casing, and insert a truck valve-stem assembly on the rim where the stem of the tube normally is. The casing is then ready for inflation and use.

If the exhaustive road tests the Council is recommending confirm preliminary tests, it may be possible to effect a war-time conservation of 210,000 tons of rubber, Mr. McGay pointed out. The inner tubes would be turned in and processed into casings, keeping many more of the nation's passenger cars and trucks on the roads and greatly easing the critical transportation problem.

Mr. McGay is a manufacturer of precision instruments for the oil industry.

Initial tests last month on the tubeless tire by the PIWC found the tire living up to claims made by the inventor.

The New York *Daily News* (November 22) in its recent investigation of tubeless tires came across one patented in 1932 by Pasquale Daddio and believed practicable, according to a gruelling test. In this case the tire casing is lined with a thin coating of rubber to avoid leaks through pores in the cord. Mr. Daddio's principle of the tire clamping itself airtight to the rim is the same as with Mr. McGay's tire, but Mr. Daddio has also added, according to the *News*, a heavy metal spring coil which fits inside the tire and tightens around the circumference of the rim to force the tire bead against the rim shoulder even before air pressure is shot in; thus the tire bead should not slip out of place when a flat occurs. Finally the inventor squirts a pint of sealing fluid into the tire as a puncture-proof feature.

The *News* further reported that United States Rubber Co. officials would witness a demonstration of this tubeless tire.

### Ford Tire Plant to Russia

Negotiations have been completed for the sale of the Ford Motor Co. tire manufacturing plant [1] at Detroit, Mich., to the government for shipment to Russia, Rubber Director William M. Jeffers announced October 30. The equipment to be sent to Russia is expected to produce a million or more tires of Russian dimensions annually.

Mr. Jeffers praised the Ford company for its prompt action in offering the plant for sale in response to his request. It is one of the most modern tire factories in the country, but has not been in operation recently.

"Both Edsel Ford and other officials of his company and O. Kelley Anderson of my organization deserve hearty congratulations for the celerity with which this transaction was carried out," he said.

"As a result, we will be able to fulfill our commitment to Russia now instead of months from now."

[1] India Rubber World, June 1, 1938, pp. 54-64.

**Secretary of Labor Frances Perkins,** Washington, D. C., in an order of November 4 set, under certain conditions, a minimum wage rate of 40¢ an hour for the rainwear industry.

**The Army Engineers Corps,** according to Gen. Raymond F. Fowler, chief of the supply division, is now ordering only pontoons or pneumatic floats made of synthetic rubber.

## CALENDAR

| | |
|---|---|
| Nov. 30-Dec. 4. | A.S.M.E. Annual Meeting. New York. |
| Nov. 30-Dec. 4. | Exposition of Power and Mechanical Engineering. Madison Square Garden, New York. |
| Dec. 3. | Ontario Rubber Group. University of Toronto. |
| Dec. 4. | Rhode Island Rubber Club. Narragansett Hotel, Providence, R. I. |
| Dec. 11. | American Standards Assn. Annual Meeting. Hotel Astor, New York, N. Y. |
| Dec. 11. | Detroit Rubber & Plastics Group, Inc. Hotel Detroit Leland, Detroit, Mich. |
| Dec. 12. | Royal Canadian Institute. University of Toronto, Toronto, Ont., Canada. |
| Dec. 16. | Rubber & Plastics Division, Montreal Section, S. C. I. Ritz Carlton Hotel. |
| Dec. 16. | Buffalo Rubber Group. Christmas Party. Hotel Westbrook. |
| Dec. 18. | Chicago Rubber Group. Christmas Party. Morrison Hotel. |
| Dec. 18. | New York Rubber Group. Christmas Party. Building Trade Employers Assn. Clubrooms. |
| Jan. 8. | Perkin Medal Award to Robert E. Wilson. Chemists Club, New York, N. Y. |
| Jan. 8. | Rubber & Plastics Division, Montreal Section, S. C. I. McGill University. |
| Jan. 11-15. | SAE War Production Meeting and Engineering Display. Detroit, Mich. |
| Feb. 12. | Rubber & Plastics Division, Montreal Section, S. C. I. McGill University. |

## Jeffers Enunciates Rubber Policies

At a dinner-meeting of the Association of National Advertisers at the Hotel Pennsylvania, New York, N. Y., November 12, Rubber Director William Jeffers discussed the extreme importance of rubber conservation as applied to the million tons of rubber in the tires of our passenger cars and trucks and stated that we must stretch that million tons as far as it will possibly go—and maybe a little bit farther. We must get along with the rubber we have until some time in 1944 when our production of synthetic rubber assumes sizable proportions, he said. He appealed to the Association to help him in being sure that all the people have a clear picture of the rubber situation all the time so that the people themselves will help to solve the present rubber conservation problem.

With reference to the synthetic rubber program, he declared that the first big plant will come into production by January, 1943, using butadiene made from alcohol. Ten other large plants will get into production during 1943, using butadiene made from petroleum. We Americans have learned something from this war, and this country is not going to be caught again where we depend on Malaya and the East Indies for natural rubber, Mr. Jeffers stated.

In a talk before the New York Herald-Tribune Forum on Current Problems, at the Waldorf-Astoria, New York, on November 16, Mr. Jeffers spoke on "Men and Management." Only when labor and management work in complete harmony can the economic freedom of the world be soundly determined, he said.

"Of all the economics that I know," he continued, "I believe that I am most profoundly conscious of the economics of the man who eats in the kitchen. . . . Upon the productive efforts, the fighting efforts and the future thinking efforts of this man of the rolled-up sleeves, depends, I believe, the economic freedom of the world."

Developing his subject further, Mr. Jeffers asked, "Who can deny that ingenious and energetic management has made our nation the greatest industrial force in the world? That is our universally acknowledged power for victory. Who would deny that the brawn of the man who eats in the kitchen is vitally necessary to exert this industrial effort?"

In discussing the rubber situation he stated that while the autoist is saving rubber by driving slowly on reduced gasoline rations and submitting his tires to periodic inspections to prevent unnecessary wear and tear, chemists and technicians are opening new fields of industrial possibilities which will be developed after the war.

In conclusion Mr. Jeffers pointed out that the men who are working in the rubber factories, tire and repair shops, etc., are the men upon whom will depend the economic destiny of America after the war.

Rubber Director Jeffers has recommended that taxicab operators refuse to carry passengers to or from places of entertainment.

### At the NAITD Convention

The annual convention of the National Association of Independent Tire Dealers, held at the Lord Baltimore Hotel, Baltimore, Md., from October 25 through October 28, had a peak attendance of more than 1,000 dealers and treaders from 43 states. The highlight of the convention was the presence of top government officials, including Rubber Director Jeffers, who discussed subjects of importance to tire men pertaining to draft deferment for tire shop men, details of the government tire repurchase and mileage rationing program, priorities for shop equipment, price administration, and labor problems in the tire industry. Many questions asked of the officials showed that they were not aware of the problems that existed in the industry. The convention did much to impress government men with the needs of the independent dealers and tire men who pointed out that some of the regulations in force were unnecessary and often burdensome. Mr. Jeffers in his address at the annual banquet reiterated his statement that the automobiles and trucks of America must be kept on rubber, and with the support of the people it could be done.

Ira Shull, of Los Angeles, was elected president; Robert A. Dean of Louisville, Ky., was made vice president, and Ashby Leeth of Washington, D. C., treasurer. Clifford Simpson, executive secretary, who received the title of executive vice president, will continue in active charge of managing the association. Several directors were appointed to replace those whose terms expire in 1943. An enlargement of the executive staff in Washington is contemplated, as well as the appointment of a number of regional vice presidents who will handle sectional matters.

### For Conservation of Druggists' Sundries

In a statement to doctors, nurses, and hospitals, Mr. Jeffers last month called attention to the need of conserving rubber articles other than tires as an important part of the nation-wide program for stretching the country's limited rubber supplies as far as possible.

"As our stockpiles of crude rubber decrease under the impact of war needs," he said, "it will become increasingly difficult to obtain sundry rubber products for civilian use. All rubber articles now in use should be as carefully preserved as tires and repaired where feasible, so that their useful life may be extended to the utmost. This is especially true of high-grade rubber goods—surgeons' gloves, for example—which require very high percentages of crude rubber in their fabrication."

Following Mr. Jeffers' statement, the WPB Conservation Division issued a set of rules for the preservation of medical and hospital rubber goods—gloves, hot water bottles, ice bags, rubber sheeting, rubber tubing, etc.

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## N.A.M. War Congress of American Industry

Foremost industrialists and high government officials will preside at the sessions of the streamlined 1942 War Congress of American Industry of the National Association of Manufacturers at the Waldorf-Astoria Hotel, New York, N. Y., December 2, 3, 4. The three-point program announced for the three days is to hear statements and discuss means of making America strong in its War Power, Man Power and Peace Power.

In a report by the research department of the Association to be presented to the meeting on "War Production and Shortages of Basic Materials", rubber poses the most serious problem.

"The critical condition of our rubber supply could have been, in large measure, avoided if the government had taken prompt action when our source of supply of crude rubber was first threatened," the report states.

Excerpts from the Baruch Committee report are quoted to emphasize conditions which had hampered the synthetic rubber program and to provide a background for the study of the crude rubber stockpile and its relation to sources of new rubber production. The N. A. M. report supports the Baruch report in stressing the urgency of pushing the synthetic rubber production program to completion in order to avoid a military crisis.

Steel shortages are due largely to maldistribution of steel products; the supply and production of copper and magnesium still present serious problems, while the outlook is brighter for obtaining adequate supplies of aluminum, lead and zinc, according to the report.

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## Correction

On page 182 of our November issue in summarizing Appendix II of the printed edition of the Baruch Rubber Survey Committee Report received during October the following statements were made concerning Butyl rubber: "An important advance in the art of compounding Butyl rubber is reported in that it may now be mixed and cured with natural rubber, Buna S, or neoprene. The field of usefulness of this rubber is therefore greatly expanded since it can be mixed with these other rubbers in the manufacture of tires and other articles, and it is now available as a recapping material for tires."

This interpretation of the statements on Butyl rubber have since been found to be unwarranted and may best be corrected by quoting the material in the Appendix II directly: "It is only recently that means have been found to attach Butyl to natural rubber or to Buna S or neoprene, because of the very different degrees of saturation of the constituent carbon atoms. For this reason its use in tires was until recently considered only possible for whole tires, but it now appears that it may prove capable of being used as a recapping material also."

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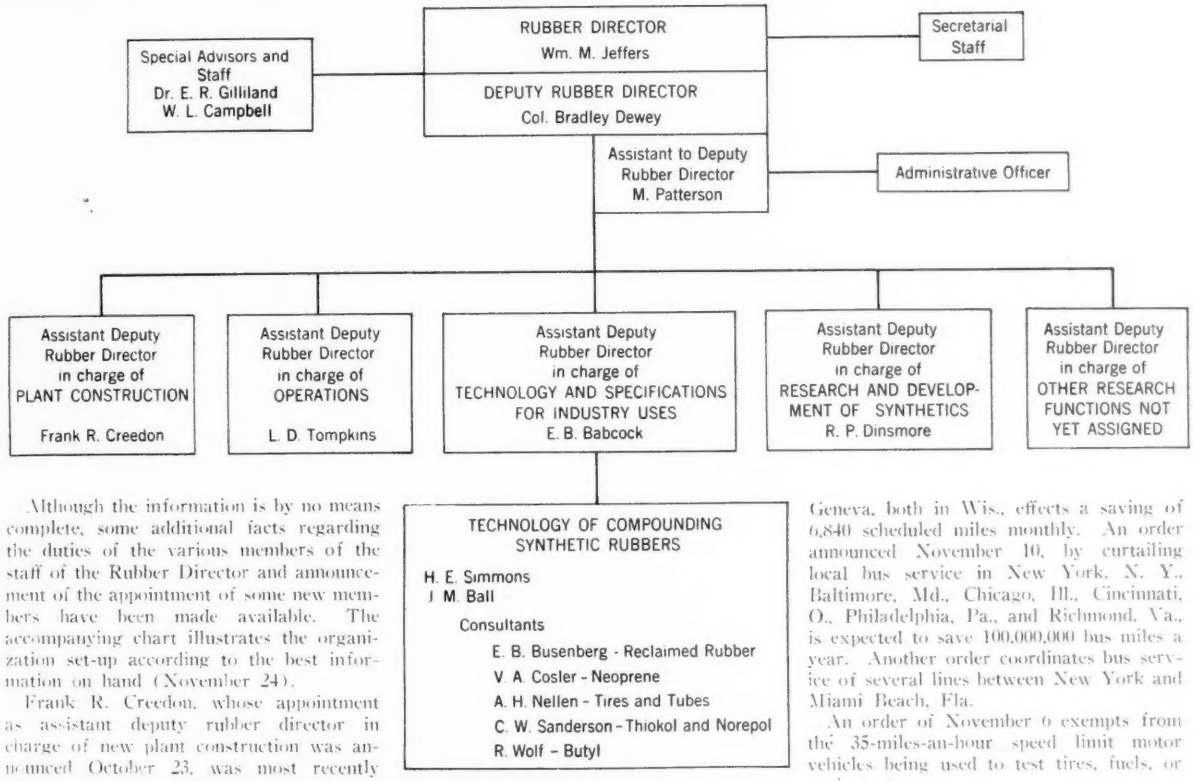
**The United States Department of Agriculture,** Washington, D. C., last month announced the appointment of William Woolford Skinner, formerly associate chief, as chief of the Bureau of Agricultural Chemistry and Engineering to succeed the late Henry G. Knight.

## Organization of Rubber Director's Office




Although the information is by no means complete, some additional facts regarding the duties of the various members of the staff of the Rubber Director and announcement of the appointment of some new members have been made available. The accompanying chart illustrates the organization set-up according to the best information on hand (November 24).

Frank R. Creedon, whose appointment as assistant deputy rubber director in charge of new plant construction was announced October 23, was most recently chief construction engineer in the Office of Chief of Engineers, Corps of Engineers, U. S. Army, in charge of construction of munitions manufacturing plants. Prior to this he was chief engineer of the Public Works Administration with headquarters in New York, N. Y., in charge of construction of all public works in the eleven northeastern states. He was born in Brockton, Mass., and is a graduate of Massachusetts Institute of Technology (1918).

There has been established under E. B. Babcock, assistant deputy rubber director in charge of Technology and Specifications for Industry Uses, a section under H. E. Simmons composed of consultants on the uses of the various synthetic rubbers. These consultants, specialists in various synthetics, are to advise and consult with the rubber industry on all questions arising from the problem of substituting these synthetics for crude rubber. At present this staff is constituted as follows:

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|---|---|
| E. B. Busenburg (Philadelphia Rubber Works) | Reclaimed Rubber |
| V. A. Cosler (Dupont) | Neoprene |
| A. H. Nellen (Lee Tire & Rubber) | Tires and Tubes |
| C. W. Sanderson (Goodyear Tire & Rubber) | Thiokol and Norepol |
| Ralph Wolf (B. F. Goodrich Co.) | Butyl |

Appointments may be made with these men in Room 5023, Municipal Center Bldg., Washington, D. C.

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**George H. Field,** deputy commissioner of the WPA, reported that during that organization's rural scrap collection campaign from May through October the farm collection crews gathered 4,000 tons of scrap rubber.

### ODT Rulings

Amendment 1 to General Order ODT No. 21, issued by the Office of Defense Transportation October 31, decrees that the first tire inspections under the Order, requiring all commercial vehicles to carry Certificates of War Necessity, must be made between November 15 and January 15. The original order called for tire inspection before November 15, its effective date. After the initial inspection tires of all commercial vehicles subject to the order must be inspected every 60 days or every 5,000 miles, whichever is completed first. Moreover no vehicle may be operated following a tire inspection unless the inspector has certified that all possible adjustments, repairs, or replacements necessary to assure maximum conservation of the vehicle's tires have been made. Inspections must take place at inspection stations designated for this service by the OPA. To date about 55,000 such stations have been established, and more are expected. A fee not above 25¢ may be charged for inspection of each passenger vehicle when it is unnecessary to remove any tires.

Several orders have recently been issued to save rubber and equipment on bus lines. Special Order ODT No. B-28, issued November 4 and effective the twelfth, relating to service between Boston and Springfield, via Worcester, all in Mass., reduces service 36%, with a saving of 21,840 scheduled bus miles monthly. Special Order ODT No. B-29, also issued November 4 and effective November 12, and affecting service between Milwaukee and Lake Geneva, both in Wis., effects a saving of 6,840 scheduled miles monthly. An order announced November 10, by curtailing local bus service in New York, N. Y., Baltimore, Md., Chicago, Ill., Cincinnati, O., Philadelphia, Pa., and Richmond, Va., is expected to save 100,000,000 bus miles a year. Another order coordinates bus service of several lines between New York and Miami Beach, Fla.

An order of November 6 exempts from the 35-miles-an-hour speed limit motor vehicles being used to test tires, fuels, or equipment.

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**Leo T. Crowley,** Alien Property Custodian, Washington, D. C., on November 7 announced that drawings and specifications of foreign-owned patent applications seized by his office will be printed and made available to American industry at a nominal price. These applications ordinarily cover latest developments in patentable fields, and many can improve American processes and devices.

All transactions between private persons or companies involving U. S. patents and copyrights in which any foreign country or foreign national has an interest now are subject to control by the Alien Property Custodian, according to an announcement November 19. Previously this control had been vested in the Treasury Department.

**Board of Economic Warfare,** Office of Exports, Washington, D. C., in "Current Controls Bulletin No. 54", October 27, rules that applications for licenses to export (even if for resale) machinery, equipment, parts, or materials for processing rubber must include a comprehensive statement as to the exact nature of the business of the ultimate consumer as well as the type of articles to be manufactured with the machinery, etc., ordered and the reason why such articles are considered essential. Also required is an estimate, with such supporting statements from the consignee as may be available, as to his existing stocks of such equipment, etc., and how long they will last.

# Revisions on Tire Prices and Rationing; Other Decrees

Amendment 5 to MPR 107—Used Tires and Tubes—issued October 22 and effective October 15, provides that the price ceiling governing ordinary transactions in damaged used tires or tubes does not apply to sales to Defense Supplies Corp. in order to clear the way for sale of unrepaired tires to the government under the Idle Tire Purchase Plan. Amendments 6 and 7, issued October 28 and effective, respectively, November 3 and October 15, relate to the raising of prices for used tires and tubes. Amendment 6 also tests minimum quality specifications for repaired tires and tubes.

Revised Price Schedule 66, as Amended—Retreaded and Recapped Rubber Tires and the Retreading and Recapping of Rubber Tires—issued October 28 and effective November 3, revises upward ceilings for such tires and any retreading or recapping work.

Amendment 35, Supplementary Regulation 1 of GMPR, issued October 28 and retroactive to October 15, states that the General Maximum Price Regulation does not apply to sales or deliveries of tires or tubes to Defense Supplies Corp. pursuant to the Idle Tire Purchase Plan.

Amendment 4 to MPR 165, as Amended—Prohibition against Dealing in Services above Maximum Prices—issued October 28 and effective November 3, excludes generally from this regulation maximum charges that may be made for services performed in connection with the sale of tires and tubes or the application of recaps to tires; such services must be computed under the separate price regulations covering those commodities. Maximum Price Regulation 165, as Amended, was further amended to make plain that it does not supersede or conflict with the service charge sections of Revised Price Schedule No. 63—New Tires and Tubes; or RPS No. 66, as Amended—Recapped Tires and Recapping Services; or MPR No. 107—Used Tires and Tubes.

Amendment No. 6 to Revised Price Schedule No. 63—Retail Prices for New Rubber Tires and Tubes—and Amendment No. 2 to Maximum Price Regulation No. 143—Wholesale Prices for New Rubber Tires and Tubes—both issued and effective November 25, set retail and wholesale ceiling prices, respectively, for new passenger-car tires of reclaimed rubber produced under WPB restrictions. The ceiling of $13.25 for a 6.00x16 reclaim tire is about 22% below the ceiling of $17.11 for a first-line tire of the same size. Wholesale prices for Grade III tires are not set in dollars and cents, but on the basis of discounts from the established retail ceiling. For instance, if a manufacturer's price on a first-line tire to a dealer in March, 1942, was 30% less than the retail ceiling for that tire, his maximum price for the reclaimed rubber tire now is the retail maximum less 30%. Maximum prices for sale of these tires by manufacturers to private brand owners are to be determined on a cost-plus basis. All prices, wholesale and retail, are subject to revision if production experience shows changes are necessary.

Amendment 6, RPS 63, also inserts in the appropriate places the names of certain manufacturers and private brand owners omitted from the original order. The regulation, moreover, now includes a list of dollars-and-cents ceilings for the tires of National Co-operatives, Inc. Specific prices have also been set for two new truck tire brands of the United States Rubber Co.

Order No. 139 under 1499.18 (c) of GMPR, issued and effective November 4, grants permission to the Mansfield Tire & Rubber Co., Mansfield, O., to increase the selling prices of two brands of bicycle tires and one brand of tube to relieve it of a "squeeze" under the GMPR.

### Tire Rationing Rules Amended

Supplementary Directive No. 1-Q, issued by the WPB November 6, delegates to the OPA authority to ration tires, casings, inner tubes, retreading and recapping materials, gasoline, and passenger cars. With this directive OPA will have full authority to prevent the sale of a used automobile if it is equipped with tires obtained or mounted in violation of tire rationing regulations. It already has this power over new cars.

The following constitute additional changes to the Revised Tire Rationing Regulations. Amendment 39 issued and effective October 22, indicates that any person may transfer any tires or tubes to Defense Supplies Corp., Rubber Reserve Co., or Reconstruction Finance Corp., or any representative thereof. Amendment 40, also issued and effective October 22, lists steps whereby dealers may increase their stocks of passenger-car Grade III tires to be ready for consumer sales when the new mileage rationing program began. Under the new regulations dealers may acquire stocks of new tires made of reclaimed rubber, and recapped and used tires for sale to motorists who have received rationing certificates from their local boards.

Ration Order No. 1A—Tires, Tubes, Recapping, and Camelback—issued November 6 and effective November 22, was issued pursuant to the direction of the Rubber Director and, along with the new Mileage Rationing: Gasoline Regulations (Ration Order No. 5C), puts into practice the various recommendations of the President's Special Committee (Baruch Report).[1] The new order also supersedes WPB Supplementary Order No. M-15-c, as Amended, and the Revised Tire Rationing Regulations, as Amended. Amendment 1 to Order 1A changes the effective date to December 1.

All passenger cars will be eligible for recapping services or for replacement tires under the national mileage program, but motorists will be limited by quotas assigned rationing boards. The grade of tire allowed in case recapping is impossible will be determined by the amount of mileage allowed applicants in their gas ration books. The boards may refuse a new tire if official inspection indicates abuse or neglect of the tire to be replaced.

The OPA early last month called upon local War Price and Rationing Boards to appoint all competent tire men in their communities as fee-basis inspectors so that the plan for periodic tire inspections can be handled with a minimum of inconvenience to vehicle operators. The number of inspectors required has been estimated as at least 100,000. It is also expected that there will be about 130,000,000 or 135,000,000 inspections annually.

The OPA on November 20 extended until December 1 the time in which motorists may dispose of their surplus tires to get gas under the new rationing regulations.

The number of tires turned in by motorists under the Idle Tire Purchase Plan totaled 2,872,000 by November 14.

Nationwide gas rationing was postponed from November 22 to December 1 because of delays in the distribution of forms and coupons.

It will be illegal for motorists to drive after December 12 if they have not registered tires and received a Tire Inspection Record.

Amendment 6 to MPR 165, as Amended, issued November 7 and effective November 13, makes the regulation conform to the provisions of the tire rationing regulations covering inspection of automobile tires and their removal incidental to inspection.

The OPA, in view of the national rubber conservation program, announced October 28 that certain plants with 100 or more employes will be required to set up Organized Transportation Plans under nation-wide mileage rationing to assure workers adequate means of getting to their jobs despite rationing restrictions.

### Footwear Rationing Regulations Revisions

Amendment 3 to Ration Order 6—Men's Rubber Boots and Rubber Work Shoes Rationing Regulations—issued October 28 and effective November 9, makes provision for appeals by those affected by the order. The fourth amendment, issued November 5 and effective November 11, restricts the use of Type 5 footwear (revised to include only that suited for use in mines) to miners only. Amendment 5, issued and effective November 21, extended from November 28 until December 5 the deadline for unrestricted stocking by distributers of rationed rubber footwear who found themselves with short inventories because they had been selling more than their suppliers could restock them with immediately.

Amendment 2 to MPR 229—Retail and Wholesale Prices for Victory Line Waterproof Rubber Footwear—issued October 26 and effective October 31, indicates that rubber footwear dealers need not make any trade-in allowances to customers who turn in unserviceable rubber footwear in buying replacements. Amendment 3 relates to the adjustment of maximum prices.

### Other Price Rulings

Amendment No. 1, Supplementary Order No. 9, issued November 11 and effective November 14, eliminates individual sellers of waste, scrap, and salvage materials from the scope of an OPA procedural regulation designed specifically for speeding price adjustments under war contracts. The amendment excludes 15 specific price schedules and regulations on

[1] See India Rubber World, Oct., 1942, pp. 57-58.

scrap materials, including Revised Price Schedule No. 87—Scrap Rubber, from the price adjustment procedure provided by Supplementary Order No. 9 and Procedural Regulation No. 6, which, the OPA states, are not well adapted to the unusual characteristics of the waste materials trade.

Amendment No. 33, GMPR, issued November 2 and effective November 5, makes a change in administrative policy, limiting the grounds upon which individual ceiling price adjustments will be granted in order to enable OPA to concentrate on the constant improvement of its basic regulations affecting many sellers rather than continue to divert its energies toward the ironing out of individual situations.

Amendment No. 37 to Supplementary Regulation No. 1, effective October 29, frees furfurol from price control to the extent sold or delivered for use in the manufacture of synthetic rubber.

Amendment 39, Supplementary Regulation 1, GMPR, issued November 6 and effective November 12, exempts from the Regulation aviation gasoline and components, synthetic rubber and components, toluene made from petroleum, and agricultural components used in the manufacture of furfural.

Order 137 under 1499.3 (b) of GMPR sets ceiling prices for the following products of Stanley Chemical Co., East Berlin, Conn.: Haydenite Base Coat No. 66K-2156A and No. 66K-2214A and Haydenite Finish Coat No. 66K-2157A and No. 66K-2215A.

Order 109 under paragraph 1499.3 (b) of GMPR, issued October 27 and effective October 28 sets a price formula relating to ¼-ounce neoprene prophylaxis bulbs produced by the Tyer Rubber Co., Andover, Mass.

Order 119 under 1499.3 (b) of GMPR, issued November 2 and effective the next day, lists maximum prices which Union Bay State Co., Cambridge, Mass., may charge for its sock lining cement CS-207.

Order 1 under 1499.13 (a) (2) of GMPR allows the Firestone Tire & Rubber Co., Akron, O., to deviate from posting requirements established under GMPR with reference to catalogs prepared for dealer distribution.

Amendment 1, MPR 220—Certain Rubber Commodities—issued November 2 and effective November 5, reveals that GMPR does not apply to the sales or deliveries of certain rubber commodities by their manufacturers and also covers applications for adjustments.

Amendment 1 to MPR 131, issued October 28 and effective November 3, sets the maximum price at which Grade C camelback produced by the Denman Tire & Rubber Co. and the Webster Rubber Co., both of Warren, O., may be sold.

Amendment 2, MPR 149—Mechanical Rubber Goods—issued October 26 and effective October 31, gives maximum prices which Dryden Rubber Co., Chicago, Ill., may charge for its rubber horseshoe pads.

### December Tire and Tube Quotas

Expanded passenger-car tire and tube quotas for December to meet needs in the first month of mileage rationing—the plan under which virtually all passenger cars become eligible to apply for needed recapping services or replacement tires—were announced November 28. The quota of passenger-car tire recapping service for December, however, has been reduced moderately since the large quotas in October and November are believed already to have provided recaps for a large portion of the tires in need of them. The total of passenger-car tires and recapping services combined is 2,301,342 for December, against 1,285,189 for November. An increase occurred in the truck tire quota over the November level to take care of unsatisfied applications of eligible truck operators accumulated and carried over from preceding months. Recapping quota for truck tires has been reduced since the accumulated demand was for replacement tires rather than recapping. Truck replacement and recapping quotas together for December amount to 489,749, compared with 376,168 for November.

The December quota of Grade I passenger car tires has been set at 126,097, against 60,513 in November. This grade includes the best quality new tires that, with a few exceptions, are available only for necessary replacements on cars that get a mileage ration of over 1,000 miles monthly.

Quota of Grade II tires, for cars that get a ration of between 560 and 1,000 miles monthly, is 368,000 against 134,470 for November. The Grade II quota previously covered only new tires with a retail list price less than 85% of the maximum price of standard Grade I casings. Now it includes, in addition, "factory seconds" so marked by the manufacturer, all new tires manufactured before January 1, 1938, and tires that have run less than 1,000 miles, but have gone far enough to wear off the mold marks.

A quota of 920,000 Grade III tires, a new category under the tire rationing regulations, has been set for December. This grade, which includes used tires, recapped tires, and new tires made of reclaimed rubber, is for necessary replacements on cars with a mileage ration of 560 miles or less.

The quota of recapping services for passenger-car tires is 887,245 for December. The November quota, which included recapped tires as well as recapping services, was 1,090,206.

December truck replacement tire quota of 340,229 is not strictly comparable with the 179,460 provided for November, since all replacement tires, recapped as well as new, are chargeable against the larger quota set for next month. Only new tires come out of the comparable November quota. Recapping service quota for truck tires in December is 149,520, compared with 196,708.

December inner tube quotas are, for passenger cars, 357,272; for trucks, 143,720.

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## WPB Changes

The WPB last month established an Office of Production Research and Development to be directed by Harvey N. Davis, president of Stevens Institute of Technology. The Office will undertake to insure rapid appraisal and utilization of processes, materials, mechanisms, and inventions in the production of war goods.

The Office of Program Determination has been consolidated with the Office of Operations to become the Office of the Program Vice Chairman, under the direction of Ferdinand Eberstadt, WPB vice chairman in charge of materials distribution. Ernest Kanzler will continue as director general for operations. Under the new plan the 36 industry branches become industry divisions, and each will have working with it a labor advisory committee, an industry advisory committee, and a requirements committee, which last will consist of representatives of the seven government agencies having claims on existing materials: Army, Navy, Maritime Commission, Office of Civilian Supply, Lend-Lease, Board of Economic Warfare, and the Aircraft Scheduling Unit.

The WPB on November 18 announced establishment of a new Controlled Materials (steel, aluminum, and copper) Plan Division, with Harold Boeschenstein, president and general manager of Owens-Corning Fiberglas Corp., Toledo, O., as director of the Division and chairman of the Controlled Materials Board. Assistant director is W. C. Skuce, supervisor of materials procurement, priorities, and inventory control, General Electric Co., Schenectady, N. Y.

The following is the personnel of the Rubber Reclaiming Industry Advisory Committee: government presiding officer, Willard Helburn, consultant to the rubber and rubber production branch; Irving Laurie, Somerset Rubber Reclaiming Works, New Brunswick, N. J.; H. A. Winkelmann, Dryden Rubber Co., Chicago, Ill.; V. L. Dingmon, Xylos Rubber Co., Akron, O.; Fred E. Fraflet, Pequanoc Rubber Co., Butler, N. J.; Louis J. Plumb, U. S. Rubber Reclaiming Co., New York, N. Y.; John P. Coe, Naugatuck Chemical Division, United States Rubber Co., New York; William H. Welch, Mid-West Rubber Reclaiming Co., East St. Louis, Ill.

D. P. Morgan, formerly deputy chief of the WPB Chemicals Branch, has been named director of the WPB Chemicals Division.

T. Spencer Shore has resigned as director of the Industry Advisory Committees; his successor is Barry T. Leithead, Principal Industrial Adviser in the Division of Industry Advisory Committees. Mr. Shore has returned to active service as vice president and treasurer of The General Tire & Rubber Co., Akron, O., but will continue as a special consultant with WPB.

Further conservation of tin, rubber, and other critical materials was discussed at three recent WPB Canning Industry Advisory Committee meetings and two specialized industry conferences in Washington. Among the problems considered was the feasibility of using glass enclosures made of material other than rubber. Merritt Greene, chief, Canned Foods Section, stated experiments are being conducted to find a rubber substitute for enclosures.

WPB on November 18 announced several important changes in Priorities Regulation No. 11, as amended October 3, which appear in Amendment No. 2 to that version.

### Vinyl Resin Requirements

Direct military requirements for vinyl resin coatings will require more of certain grades of resins than is now available, the industry learned last month at the meeting of the Vinyl Resins Producers Industry Advisory Committee in Washington, attended also by representatives of the armed forces and WPB. Supplies of vinyl resins, all groups agreed, must be forecast as far into the future as possible so that fabricators can set up production schedules. For instance, little can be done to increase the production of butyral types because of raw material shortages. While polyvinyl butyral types are preferred for Army raincoats and similar products, it is expected that certain other resins, as the vinyl chloride types, will have to be substituted. Anticipation of such revisions will better enable fabricators to maintain top production.

Demand for vinyl resins during 1943 is expected to increase over current demand. Substitution of certain vinyl resins for rubber, especially in protective coating, clothing, and adhesive fields will place very heavy demands on vinyl resin supplies.

The industry is interested in the use of certain vinyl resin polymers for adhesive work, particularly as a substitute for crude rubber latex in the shoe industry. Since the raw material for this grade of resin is also required for coated fabrics, where it is entering into direct war products, there is very little left over for further substitutions for latex adhesives. It appears that certain reclaimed rubber compositions containing vinyl polymers or crude rubber latex will make a satisfactory adhesive in certain operations.

Use of certain vinyl resins for food packing must continue, industry members said, because prohibitive changes in food packaging machinery would have to be made if substitute materials were introduced. All groups at the meeting emphasized that no new food packaging requirements should be permitted to be developed as a result of substitution for other critical materials.

Suggestions for handling chemical allocations under Preference Order M-110 (vinyl polymers) and M-240 (vinyl acetate) were made by the Committee in the general discussion covering the mechanics of allocation procedure.

### Additional Orders Issued

General Preference Order M-30, as amended August 8, 1942, was followed by two Amendments: Amendment 1, issued October 16, which struck out subparagraph (v) in Paragraph (e)(7) covering exceptions to the restrictions on delivery of ethyl alcohol and related compounds; and Amendment 2, issued November 11, which prohibited the use of ethyl alcohol in the manufacture of rubbing alcohol except for the use of physicians, dentists, veterinarians, persons holding prescriptions, etc. Also sale of rubbing alcohol and rubbing alcohol compounds because they are required for explosives, synthetic rubber, and numerous other chemical operations necessary in the war program is restricted.

Limitation Order L-123, as Amended November 24, 1942—General Industrial Equipment—effective December 1, provides that purchase orders for necessary repair and maintenance parts for many items of general industrial equipment must be accompanied by a certificate, giving the nature of the purchase.

Limitation Order L-192, as Amended November 17, 1942—Construction Machinery and Equipment—effective November 30, to conserve rubber and other critical materials used in the production of construction machinery and equipment, further restricts manufacture and transfer of such machinery and equipment and supersedes Limitation Orders Nos. L-82 and L-82-a.

Limitation Order L-201, issued October 24, restricts the manufacture of automotive tire chains and chain parts.

### Legal Actions

WPB Suspension Order S-140, issued November 11 and effective until six months after the close of the present war, prohibits Empire State Mat Co., Inc., manufacturer of rubber mats, Brooklyn, N. Y., for violations of Supplementary Order M-15-b and of Priorities Regulation No. 1, from accepting or making deliveries of rubber, scrap rubber, or reclaimed rubber and from using in any way any such rubber.

Suspension Order S-160, effective from November 23, 1942, until May 23, 1943, was issued against the Long Island Mat Co., Lynbrook, L. I., N. Y., because it used enough scrap rubber to manufacture about 3,500 rubber mats for civilian use in violation of Amendment No. 6 to Supplementary Order No. M-15-b. For the six-month period the company may not receive, consume, or deliver any rubber except under express order of the Director General for Operations.

## Rubber Chemicals Production in 1941

A preliminary report on the 1941 United States production of synthetic organic chemicals was recently released by the United States Tariff Commission, Washington, D. C. The report showed that 1941 sales of all synthetic organic chemicals were valued at 724 million dollars, an increase of 50% over the 1940 record sales. Figures of production are considerably larger than those of sales because a large part of the total output of synthetic organic chemicals is consumed in further processing by producing companies. The total production of coal-tar rubber accelerators was 15,210,986 pounds. The value of 10,805,315 pounds sold was $5,158,692. Non-coal-tar accelerators to the amount of 19,082,521 pounds were produced, and the 17,233,435 pounds sold were valued at $4,866,893. A total of 25,364,278 pounds of rubber antioxidants was produced from coal tar; the value for the 20,449,940 pounds sold was $9,876,081. The 1941 production of rubber chemicals reached 59,655,785 pounds. Sales of 48,488,690 pounds totaled $19,901,866. Statistics concerning plasticizers, solvents, and other chemicals were omitted from the 1941 report to avoid disclosure of information that might aid the enemy.

# OHIO

## Goodrich Activities

The B. F. Goodrich Co., Akron, will furnish engineering and technical service to a company organized by the Government of Colombia to establish a tire and tube factory in that country. It is understood Colombian rubber will be used.

Goodrich recently presented to the United States Government thousands of seeds from selected *Hevea* trees growing in the company's experimental nursery on the island of Santo Domingo, which has been maintained since 1931. The seeds are being collected under the auspices of the Bureau of Plant Industry, U. S. Department of Agriculture, which is in charge of a program for promoting the cultivation of rubber bearing plants in the Western Hemisphere. Besides the seeds Goodrich is also supplying the government with budwood from high-yielding trees.

The Goodrich Company recently developed a "speed warden" device than can be installed on all accelerator pedals to help motorists comply with the 35-mile-per hour rubber conservation level and speed law. President John L. Collyer estimated that 100% observance of the speed limit in the next 12 months would mean that the tires on the nation's 27 million private passenger cars would keep them rolling 31 billion miles farther than could be expected under normal speed conditions.

### Personnel Mention

Robert V. Yohe, of Goodrich's chemical division, at a Farm Chemurgic Council regional conference at Cincinnati on November 17, stated that the United States within two years after Pearl Harbor probably will be depending upon American synthetic rubber to fill 90% of its rubber needs. Reporting on technical progress being made in synthetics, Dr. Yohe pointed out that already "almost all essential rubber articles can be made from this 'all-American' rubber, including hundreds of products being used by our armed forces." He also said that tires with a content of 99.84% synthetic rubber are being tested throughout the nation, and that under certain severe service conditions they wear better than tires of natural rubber although "several difficult problems remain to be solved" in the case of synthetic rubber tires in the larger sizes for trucks and buses.

J. D. Beebe, Goodrich engineer, at a meeting of the American Society of Mechanical Engineers in New York, N. Y., November 6, discussed how rubber is being utilized as an engineering material in speeding and implementing the nation's war effort. Among the products mentioned were a rubber spring for autos, now used on certain amphibian combat vehicles; endless band tracks for tanks, etc.; and rubber pontoons. The speaker also covered the use of synthetics.

Howard E. Fritz, Goodrich director of research, on October 30 addressed the Engineers Society of Pennsylvania on the subject of synthetic rubber and tires thereof.

Forty-four veteran employes whose total service amounts to 1,100 years with the Goodrich organization have organized a Pacific Coast chapter of the Akron company's Twenty-Year Club.

E. J. Hammerly, salesman in the Philadelphia district of the industrial products sales division, recently completed 30 years with Goodrich.

## Goodyear Activities

The Goodyear Tire & Rubber Co., Akron, has announced that its passenger-car tire building rooms, idle almost since the country's entry into the war, are busy again making "War Tires" of regenerated rubber.

Establishment of a new department, plastic research, as a section of the research department and under W. H. Nicol, responsible to H. R. Thies, was announced last month by Factory Manager W. S. Wolfe.

Goodyear chemists in cooperation with engineers of the Peerless Photo Products Co., Shoreham, L. I., N. Y., have developed an emulsified Pliofilm, known as Transphoto film, which is said to maintain its exact size under all conditions of wetting and handling. It is being used throughout the airplane and similar industries to speed the fabrication of templates for war-expanding factories throughout the nation.

George K. Hinshaw, manager of Foreign Operations, Inc., is also acting manager of Goodyear's development department during the absence of R. P. Dinsmore, one of the recently appointed technical consultants assigned to the staff of Deputy Rubber Director Bradley Dewey in Washington, D. C.

Frank J. Carter, since 1938 general superintendent of the Goodyear plant at Sao Paulo, Brazil, has been appointed personnel manager of Goodyear Aircraft Corp. at Akron, succeeding R. S. Pope, now director of personnel for Goodyear Tire & Rubber Co.

**Charles Allen Thomas,** director of the Central Research Laboratories, Monsanto Chemical Co., at Dayton, O., in an address on November 12 before 1,800 sales executives in St. Louis, Mo., stated that the half century it took the natural rubber industry to reach an annual output of 600,000 tons will be duplicated in one-twenty-fifth the time by the chemical industry in providing 1,100,000 tons of synthetic rubber by 1944. Under wartime urgency the chemical industry has been called upon to supply in less than two years vast amounts of synthetic rubber raw materials; the goal is 1,100,000 tons by January, 1944. Dr. Thomas further believes that after the war, instead of natural rubber alone, we shall have numerous chemical elastomers, all test-tube creations and designed to fit specific needs. He also predicts that "synthetic rubbers will capture a great many markets in which the natural product formerly enjoyed an unchallenged monopoly."

**J. L. Miller,** chief metallurgist, Firestone gun-mount division, won the second grand award of $11,200 in the 2½-year welding study program sponsored by The James F. Lincoln Arc Welding Foundation, Cleveland, O.

**The National Rubber Machinery Co.,** with headquarters in Akron, O., recently made extensive improvements to its several plants. An extension to the machine shop in Columbiana, O., comprising over 12,000 square feet of floor space, has been built and equipped to take care of current orders, defense and otherwise. The equipment there includes 10-ton cranes to handle heavy parts. The foundry at the Clifton, N. J., plant has been remodeled and expanded, also to take care of pressing current demands.

**The Association of American Battery Manufacturers, Inc.,** 2706 First-Central Tower, Akron, at its annual convention, October 22-23, in Chicago, Ill., elected the following officers: president, B. F. Morris, of Thomas A. Edison, Inc.; first vice president, E. T. Foote, Globe Union, Inc.; second vice president, J. H. McDuffee, Electric Auto-Lite Co.; secretary, A. H. Daggett, National Battery Co.; treasurer, L. A. Doughty, Carlile & Doughty, Inc.; directors, O. V. Badgley, Delco Remy Division of General Motors Corp., A. J. Baracree, Am-Plus Storage Battery Co., H. C. Montgomery, Hobbs Battery Co., Lester Perrine, Perrine Quality Products Corp., C. L. Feldtkeller, Solar Corp., and C. E. Murray, Willard Storage Battery Co.

# MIDWEST

## N.S.C. Rubber Section Awards and Elections

Sectional officers for National Safety Council, Inc., 20 N. Wacker Drive, Chicago, Ill., were elected at the National Safety Congress, October 27-29; Sherman Hotel, Chicago. The members of the Rubber Section, executive committee, 1942-43, comprise: General Chairman John L. Grider, American Hard Rubber Co., Butler, N. J.; Vice Chairman in Charge of Program Paul Van Cleef, Van Cleef Brothers, Chicago; Secretary John E. Lovas, United States Rubber Co., Passaic, N. J.; News Letter Editor Roland Kastell, U. S. Rubber, New York, N. Y.; Engineering Committee Chairman Thomas F. Boyd, Manhattan Rubber Mfg. Div., Raybestos-Manhattan, Inc., Passaic; health committee—Chairman W. S. Ash, U. S. Rubber, Detroit, Mich., and J. Newton Shirley, Arrow Mutual Liability Insurance Co., Newton, Mass.; Membership Committee Chairman Glen D. Cross, Firestone Tire & Rubber Co., Akron, O.; members at large— E. W. Beck, U. S. Rubber, New York, R. A. Bullock, Corduroy Rubber Co., Grand Rapids, Mich., Ralph S. Fornum, U. S. Rubber, Detroit, Oliver Hopkins, U. S. Rubber, Providence, R. I., C. F. Horan, Hood Rubber Co., Watertown, Mass., J. M. Kerrigan, U. S. Rubber Reclaiming Co., Inc., Buffalo, N. Y., W. H. MacKay Dunlop Tire & Rubber Corp., Buffalo, Urban L. Moler, Inland Div., General Motors Corp., Dayton, O., R. W. Morse, Firestone, William Spanton, American Hard Rubber, Akron, O., and, R. M. Weimer, Dayton Rubber Mfg. Co., Dayton, O.

The winners of the Rubber Section Annual Safety Contest for 1941-42 consisted of the following firms which received trophies: Van Cleef Brothers, Collyer Insulated Wire Co., Inc., Providence, Canadian Lastex, Ltd., Montreal, P. Q., Lobl Mfg. Co., Middleboro, Mass., Fabric Fire Hose Co., Sandy Hook, Conn., and U. S. Rubber —General Development Dept. and Indianapolis plant. Two companies which received certificates were the U. S. Rubber Ball-Band Plant, Mishawaka, Ind., and U. S. Rubber footwear plant, Naugatuck, Conn.

## Rubber Conservation by Detroit Gasket & Mfg. Co.

Definite steps in the interest of rubber conservation should result from the announcement of the Detroit Gasket & Mfg. Co., Detroit, Mich., of a new product in the form of its 77 closure material for a solution of the food packer's problems, and a new rubber substitute suitable for the manufacture of braided rubber hose, packing, and molded goods.

Harry B. Denman, chief chemist for this company, states that the 77 closure material or synthetic canning ring was created from by-products of the petroleum industry and the farm, materials that are non-critical at present. The importance of this new discovery, since many food packers have had to consider glass containers for the products, can be estimated from the fact that the volume of rubber canning rings for which it can be substituted will be several times the figure of 27,000,000 gross required for home canning alone. Tests by many responsible food packers reveal that the performance of the new material has never failed to equal the sealing qualities of the rubber canning ring.

The laboratory of Detroit Gasket together with the laboratories of many other companies which make rubber goods or use rubber in their products has been searching for several months for a satisfactory replacement, and many discoveries have been brought to light. As a result of hundreds of experiments, this company decided to concentrate its efforts on work starting with a resin base and other less critical materials formerly not considered acceptable. Six months of testing, checking, and actual making of "rubber" items have revealed a compound that measures up to "natural rubber" standards for hose, packing, and molded goods with very few exceptions.

In commenting on both of these new materials Lloyd H. Diehl, president of the company, says: "We have not discovered the panacea to the rubber problem, but we have developed new materials that will release millions of pounds of raw rubber for more vital, more critical war needs. Our facilities for their production are limited, but arrangements may be made for others to use our formula and thus spread the benefits to the greatest number of Americans."

**Fred A. Seiberling Co.**, 1700 Estes Ave., Chicago, Ill., manufactures Seiberling Sealleak, a semi-fluid compound designed to prolong tire life when injected into the inner tube through the valve stem. It tends to increase mileage through the maintenance of uniform air pressure and the sealing of punctures.

**Schacht Rubber Mfg. Co.**, Huntington, Ind., has named R. K. Paul personnel director. Mr. Paul for the past eight years was sergeant of the Huntington Police Department in charge of communications.

**Thirty-six rubber firms in the Midwest** paid 15,100 workers $630,000 in wages, respective gains of 0.3% and 3.5% over the previous month. Employment, however, in rubber manufacturing plants has taken a decided loss from a year ago.

**Monsanto Chemical Co.**, St. Louis, Mo., has elected to the board Charles Allen Thomas, director of the central research department at Dayton, O., and Ozborne Bezanson, vice-president and general manager of Monsanto's Texas Division.

**Wishnick-Tumpeer, Inc.**, 295 Madison Ave., New York, N. Y., named Calvin Yoran, until recently with the Featheredge Rubber Co., Chicago, Ill., chief chemist of its research laboratory.

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**The B. E. Dougherty Co.**, chemicals and raw materials, 1807 E. Olympic Blvd., Los Angeles, Calif., has announced that Charles H. Churchill has joined the organization, and part of his duties are to service the rubber, aircraft, news ink, paint, and allied industries. Mr. Churchill has been connected with the rubber industry for several years, but for the past six months was with the WPB. The Dougherty company has expanded more than 100% in terms of space and personnel during the current year.

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## Emulsifying Agents for Synthetic Rubber

Two companies have suggested the use of their special emulsifying agents for use in the dispersion of butadiene, styrene, etc. in water as a possible improvement over the use of fatty acid soaps in the emulsion polymerization of these synthetic rubber materials. Polyhydric alcohol esters, such as its Emulsifier S 541, are suggested by Glyco Products Co., Inc.; while KEMulsion Base A-4 (type not disclosed) is suggested by Kem Products Co., Inc.

It is pointed out that non-ionic emulsifiers might have the advantage in being less critical than fatty acid soaps in their effect on the time and degree of polymerization obtained in the manufacture of the synthetic rubbers and might aid in the production of more uniform synthetic rubbers. Smaller amounts of these special emulsifying agents should be necessary, and the finer degree of subdivision of the monomer should increase reactivity during polymerization.

# EASTERN AND SOUTHERN

## New Carbon Black Plant in La.

A $500,000 furnace-type plant for the manufacture of carbon black from natural gas will be erected at Eola, La., according to Joseph L. McHugh, State Conservation Commissioner. The new plant is being built by the Southern Carbon Co., Monroe, La., and will consume gas that is presently being flared or vented into the air. About 6,000,000 feet a day of the formerly wasted product will be used, and it is expected that a yield of from seven to nine pounds per thousand cubic feet will be produced.

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**Robert T. Vanderbilt**, president, R. T. Vanderbilt Co., Inc., 230 Park Ave., New York, N. Y., will be a sponsor of an "Industries Dinner" for Russian War Relief, according to Lewis H. Brown, president, Johns-Manville Corp., New York, and general chairman of the relief agency's Industries Division. The dinner will be held December 10 at the Waldorf-Astoria Hotel, New York.

**Johnson & Johnson**, New Brunswick, N. J., has elected Treasurer F. A. Cosgrove acting president following the resignation of Arthur R. Clapham, now a lieutenant commander in the United States Navy. Newly appointed executive assistants to Mr. Cosgrove are P. D. L'Hommedieu and Kenneth Perry. The latter, who is the company's general counsel, has been made also a vice president. His former office, secretary, has been given to John J. Gibson, Jr.

**National Electrical Manufacturers Association** recently held its annual luncheon at the Hotel Waldorf-Astoria, New York, N. Y., at which Fifty-Year Certificates were presented to five pioneers who have been associated with the electrical industry that long. Among those so honored were F. A. Merrick, vice chairman, Westinghouse Electric & Mfg. Co., Pittsburgh, Pa., and Henry D. Reed, consultant, Anaconda Wire & Cable Co., New York. Fifteen members were elected to the Association's board of governors, including: B. W. Clark and A. C. Streamer, Westinghouse; W. R. G. Baker and E. O. Shreve, General Electric Co., Schenectady, N. Y.; and F. C. Jones, Okonite Co., Passaic, N. J.

**Farrel-Birmingham Co.**, Ansonia, Conn., has appointed Edward S. Coe, Jr., manager of its New York, N. Y., office at 79 Wall St., to succeed the late E. H. Thomas. Mr. Coe, who has been with the company since 1936, spent two years at the Buffalo, N. Y., plant on gear sales, a short time at the New York office, more than a year as sales engineer in the Chicago, Ill., office, and the remaining period in sales engineering at Ansonia. A graduate of Worcester Polytechic Institute (C. E., '31), Mr. Coe had previously worked four years for the American Steel & Wire Co. at its Trenton, N. J., and Worcester, Mass., plants.

## U. S. Rubber Co. News

The Fisk Dealer Advisory Council recently met in Chicago, Ill., to discuss the dealer's contribution to retail merchandise and maintenance of vital wartime transportation. Among those attending were J. C. Ray, U. S. Rubber sales manager for Fisk tires; A. N. Guy, assistant sales manager; president of the Council, Thomas E. Hogan, of Boston, Mass.; Currie B. Witt, Tampa, Fla.; Charles F. Reynolds, Providence, R. I.; Carl Schwartz, Newark, N. J.; I. T. White, Tulsa, Okla.; Melvin Shook, Abilene, Tex.; Al Nielson, Sacramento, Calif.; and Bar Wynns, Los Angeles, Calif.

Cyrus S. Ching, director of industrial and public relations at U. S. Rubber, on November 10 was named a member of the War Labor Board, on which he had previously been serving as an alternate member, representing industry.

T. H. Young, director of advertising, U. S. Rubber, has been appointed a director of Advertising Council, Inc.

Harvey H. Harkins, research chemist at U. S. Rubber's Providence, R. I., plant, spoke before the Milwaukee Chapter of the American Society for Metals, Milwaukee, Wis., October 20 on "The General Significance of Rubber—Both Natural and Synthetic Rubber—to Present National and World Problems."

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**John P. Sullivan**, a former manager and secretary of the Rubber Trade Association of New York, Inc., 15 William St., New York, N. Y., has been appointed president and director of Copper Recovery Corp., 155 E. 44th St., New York, where he recently had been assistant to the president. Previously Mr. Sullivan had been secretary and treasurer of the Rubber and Metal Clearing associations and the other clearing associations of Commodity Exchange, Inc., 81 Broad St., New York.

**Westinghouse Electric & Mfg. Co.**, East Pittsburgh, Pa., according to Vice President H. V. Putnam, has made Russel L. Whitney sales manager of the company's transformer division in Sharon, Pa. Sales Manager A. P. Bender has been named assistant sales manager owing to an extended illness. A. C. Farmer, assistant sales manager, has been appointed assistant to Vice President Putnam, who is also manager of the division.

**Consolidated Products Co., Inc.**, dealer in used equipment, 15 Park Row, New York, N. Y., had an "exhibit-in-motion" at the National Chemical Exposition, Sherman Hotel, Chicago, Ill., November 24-29. The many-sided services of the company were graphically illustrated, and two groups of photographs showed actual reconditioning of machinery at Newark shops and also plant liquidations.

**The manufacturers' excise tax** applicable to rubber goods was repealed as of November 1, 1942.

# CANADA

## Williamson Rubber Chief

Rubber, on November 4, was withdrawn from the jurisdiction of the Department of Munitions and Supply, Ottawa, Ont., and a new rubber control branch was set up under Alan H. Williamson, formerly supplies controller. J. A. Martin, a deputy controller of supplies, is now deputy rubber controller.

Henry Borden, coordinator of controls and chairman of the Industries Control Board, has been made also acting supplies controller; while J. A. Lamprey and G. P. Kaye remain deputy supplies controllers.

Mr. Williamson on November 12 stated that owners of trucks and passenger cars eligible for new tires under the control regulation will be refused new ones if they fail to employ retreading to obtain the last mile of service from their present casings.

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**Department of Munitions and Supply,** Ottawa, Ont., has ordered, effective November 1, 1942, that Canadian distilleries discontinue producing alcoholic beverages and confine operations to the production of alcohol for war purposes. Sale of existing stocks of beverages will not be prohibited, but sales and deliveries of future production of alcohol 65% overproof or higher must have the permission of the Controller of Chemicals. The Controller stated that the munitions program now requires the entire alcohol output of the distilleries and that the total capacity is essential for the needs of the synthetic rubber, chemicals, and explosives program.

The Department on November 9 announced the dissolution of the rubber substitutes advisory committee, which has served its purpose in assisting in the initial development of facilities for producing synthetic rubber in Canada. For some time its work has been carried on by the newer synthetic rubber technical advisory committee, which will continue to function. J. R. Nicholson, general manager of Polymer Corp., Ltd., Toronto, Ont., government-owned synthetic rubber company, has retired as chairman of the synthetic rubber committee, but will remain a member. His successor is G. S. Whitby, now of Akron, O., U. S. A.

**Polymer Corp., Ltd.,** Toronto, Ont., has made J. W. Holmes, Jr., executive assistant to President R. C. Berkinshaw in addition to his other duties as executive assistant to General Manager J. R. Nicholson.

**McGill University** scientists, Montreal, P. Q., are said to be deeply interested in the possibilities of forests as a source of alcohol for the production of synthetic rubber, along the lines of development recently reported from Sweden.

**H. L. Blachford,** 977 Aqueduct St., Montreal, P. Q., has incorporated his business under the name H. L. Blachford, Ltd., as of November 1, 1942. There is no change of management or policy involved.

## Rubber Footwear Outlook

*The Shoe & Leather Journal* in a recent analysis of the Canadian rubber footwear range for 1943 indicated that the line-up has been trimmed down to a basis of minimum standard types for those to whom rubber footwear is an absolute necessity. The extended use of reclaimed rubber also has been well developed.

As of January first, women's fabric galoshes will be stripped of their fashion appeal. Only one style will be made, and that of serviceable fabric and a minimum of rubber. In the heavy category the following articles will remain: black general-purpose boots in three-quarter and knee height (reduced); men's and boys' short general-purpose boots; 12-inch black leather top lumberman, in one pattern only, black top; men's black, ribbed, gum lumberman, vamp blucher with cleated sole and safety toe (for mining trade); men's, boys' and youths' black gum lumberman bal; women's and misses' black gum lumberman, bright finish bal; child's gum lumberman, black moccasin vamp bal.

The only permissible buckle overshoes are men's four- and two-buckle excluder in medium weight cashmerette (cotton); men's one-buckle arctic of the same material; misses' and children's three-buckle excluder of similar design. In rubber galosh types there are one dome-fastened number for women and one for misses and children. In the future this will be confined to two domes to conserve metal. Overs are restricted to a moccasin type for men with rolled edge; a plain edged moccasin for men, boys, youths, women, and children; a heavy storm number with rolled edge; medium weight overs in black, brown net lining, for men, boys, youths, women, misses and children—whole and half sizes except in boys and youths; men's lightweight spat clog in whole and half sizes.

Without official regulation, rubber companies are rationing. But their methods are fair so that distribution may be equalized. Naturally, however, those engaged in essential services have preference.

Next summer will bring 100% rubberless-soled sports shoes, etc., if manufacturers are successful in their present experiments.

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**Wartime Prices and Trade Board,** Ottawa, Ont., has ruled that no special holiday packaging may be used by a manufacturer for suspenders. The price of combination sets of suspenders and garters must not be more than that during last Christmas season.

**James R. Martin,** tire rationing officer in the sub-regional office of the Wartime Prices and Trade Board, Sudbury, Ont., has been appointed supervisor of rationing, with 30 local boards in the Northern Ontario region under his supervision.

**Frank Dowsett,** public relations counsel, Gutta Percha & Rubber, Ltd., Toronto, Ont., recently completed a five weeks' tour of the Maritime Provinces, during which he also cooperated with the Wartime Information Board, Ottawa, Ont., by addressing many organizations.

**War Order A-435,** dated October 13 and amending Order A-406 of September 22, lifts the restrictions imposed by the previous order on storage batteries for trucks, buses, farm implements, road making machines, etc., aircraft, or motorcycles, and provides that no one shall manufacture, assemble, or produce storage batteries except in the styles and sizes indicated in the order.

**The Royal Automobile Club of Canada,** Montreal, P. Q., has sent a resolution to the Premier of the Dominion urging that the government consider adoption of a policy similar to that in the United States in regard to the provision of reclaimed and synthetic rubber tires for the maintenance of all motor vehicles for the duration.

**S. R. Skelton,** Goodyear Tire & Rubber Co. of Canada, Ltd., New Toronto, Ont., has been elected a director of the Association of Canadian Advertisers for 1943 and also a member of the Canadian Advisory Committee of the Audit Bureau of Circulation.

**Canada Wire & Cable Co., Ltd.,** Leaside, Ont., has authorized redemption by lot of 3,555 of its outstanding 6½% cumulative redeemable preferred stock, to take place December 15. This will leave outstanding 25,000 shares, as minor redemption of 11 shares occurred recently.

**Royal Canadian Institute** will meet at 8:15 p.m., December 12 at Convention Hall, University of Toronto, Toronto, Ont., to hear H. I. Cramer of Sharples, Inc., Philadelphia, Pa., discuss "Synthetic Rubber."

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# OBITUARY

## C. L. Weberg

DEATH came to C. L. Weberg, 58, since 1921 assistant comptroller of foreign operations for Goodyear Tire & Rubber Co., Akron, O., when he succumbed to a heart attack on a train at Walnut Ridge, Ark., November 12. The deceased had been with Goodyear since December, 1920, when he joined the company as assistant treasurer. A graduate of New York University's School of Commerce, he was with Price Waterhouse & Co. before coming to Akron.

The body was returned to Akron for funeral services.

Mr. Weberg's wife, son, and two grandchildren survive him.

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## A. R. Cochran

A. R. COCHRAN, since 1929 manager of the London, Ont., Canada, branch of Gutta Percha & Rubber, Ltd., Toronto, Ont., died recently following a brief illness. Mr. Cochran had been with Gutta Percha for 20 years, having joined its St. John, N. B., branch as a salesman in 1922.

## Louis J. Plumb

LOUIS J. PLUMB, president, treasurer, and general manager of U. S. Rubber Reclaiming Co., Inc., 500 Fifth Ave., New York, N. Y., and an outstanding figure in the trade for more than 35 years, died at his home in Bronxville, N. Y., November 7. Death was indirectly due to coronary thrombosis.

Mr. Plumb entered the company of which he was president late in 1904 as a chemist, after a short period in the employ of Klipstein & Co., in New York. He became chief chemist of U. S. Rubber Reclaiming in 1908, vice president in charge of sales in 1918, and treasurer, general manager, and president in 1922, which positions he held until his death. He was also head of the D. S. Plumb Co., Inc., Newark, N. J., manufacturer of intricate mechanical instruments, founded by his father, the late David S. Plumb.

Mr. Plumb was born in Newark, N. J., December 6, 1883. He was educated at Stevens Preparatory Institute and Princeton University (B. S., 1904; M. A., 1907). He was awarded his master's degree on the presentation of a thesis on the chemistry of rubber and the methods of its analysis. For a number of years this treatise was used as a laboratory text until the appearance of more elaborate works by other technicians. He was probably the first rubber chemist to establish brands of reclaimed rubber on a purely technical basis, such as standardizing the product on guaranteed content of rubber, acetone extract, and physical characteristics and prepared some of the first bulletins and reports furnishing the rubber industry with technical data on reclaim types.

He was an active member of the American Chemical Society, and was connected with the Rubber Chemistry Section, predecessor of the present Division of Rubber Chemistry, since 1909. In 1919 he was a member of the executive committee of the Rubber Section. In 1924 he was vice chairman of the Reclaimers Division of the Rubber Association of America. When the latter organization dropped from its ranks those who were not manufacturers of rubber products, Louis Plumb instigated the founding of the present Rubber Reclaimers Association, in June, 1929, and was a charter member. He served also as its vice president (1929), member of the executive committee (1929), secretary-treasurer (1930-1933), president and director (January 8, 1933, to January 7, 1936), and chairman of the executive committee at the time of his death.

During the present emergency, Mr. Plumb devoted a good deal of his time cooperating with the WPB in Washington on problems concerning the production and use of reclaimed rubber. He had recently been named as a member of the Reclaimed Rubber Industry Advisory Committee of the WPB. During the period of the NRA, this executive was chairman of the code authority for reclaimed rubber and presented at Washington the reclaimers' code.

The deceased was also a member of the Princeton Club of New York and the Siwanoy and Larchmont Country clubs.

Funeral services were held at his home in Bronxville on November 9, with interment in Kensico Cemetery.

*Blank & Stoller, Inc.*

Louis J. Plumb

Surviving are his wife, a daughter, and two sons, John S. and David S. John S. Plumb is factory manager of the firm's plant at Buffalo, N. Y.

## Stanley W. Harris

A HEART attack proved fatal, October 11, to Stanley W. Harris, president of McNeil Machine & Engineering Co., Akron, O. Mr. Harris in 1909 founded the Akron Rubber Mold & Machine Co., Akron. Nineteen years later his company merged with others to form the National Rubber Machinery Co., Akron, of which he was president until 1935. Later Mr. Harris headed the McNeil concern.

Born in Talmadge in June, 1877, he attended grade and high school there and then began his career as a machinist. Besides being a Mason, Mr. Harris was also a member of the Akron City and Portage Country clubs.

Funeral services and interment took place at Talmadge, October 13.

Mr. Harris leaves a wife and brother.

## Bennet B. Bristol

BENNET B. BRISTOL, who with his brother, Edgar, founded the Industrial Instrument Co. in 1908, which later became The Foxboro Co., Foxboro, Mass., died in Falmouth Heights, Mass., November 10 after a long illness. He had been The Foxboro Company's treasurer and clerk.

Mr. Bristol was born in Naugatuck, Conn., May 3, 1868, and was graduated from Stevens Institute of Technology in 1893.

Funeral services and burial took place at Foxboro.

Mr. Bristol is survived by his wife, six children, a brother, a sister, and 19 grandchildren.

**Flight-Lieutenant MacDonnell,** formerly with the Kaufman Rubber Co., Ltd., Kitchener, Ont., was recently killed in an airplane accident.

## Robert Lyle Baird

A HEART attack caused the death, November 15, of Robert Lyle Baird, manager of the rubber department of H. Hentz & Co., New York, N. Y. A native New Yorker (May 3,1889), Mr. Baird attended the Polytechnic Preparatory Country Day School of Brooklyn, N. Y., and graduated in 1906. For many years he was vice president of the Baird Rubber & Trading Co., New York, a firm founded by his father, Robert Breckenridge Baird. Mr. Baird retired from the firm in 1928, but joined Hentz in 1930.

He was a member of the Rubber Trade Association, Montauk and Crescent Athletic clubs, Shinnecock and Bay Shore Yacht clubs, Men's Council of Colony House, Inc., the directorate of Polytechnic Prep Alumni Association, and of the Board of Trustees of Berkeley Institute, a 33rd degree Mason, a World War veteran, and at his death a chief petty officer in the Coast Guard Reserve.

Services were held in Brooklyn on November 17 and Mr. Baird was buried in Quogue, L. I., November 18.

He leaves a wife, a daughter, and two sons.

## Clyde Coleman

ON NOVEMBER 6, Clyde Coleman, research chemist of the General Development Division, United States Rubber Co., at Passaic, N. J., died at his home after a prolonged illness. Dr. Coleman was born in Galesburg, Ill., October 19, 1883. He held a B. A. and an M. A. from Williams College (Class of 1909) and received his doctorate from the University of Chicago in 1916. In that year he was employed as operating superintendent by the Federal Dyestuffs & Chemical Co., Kingsport, Tenn., where he remained until 1918. Following that, he was associated with Dyestuff Division, E. I. du Pont de Nemours & Co., Inc., Deepwater Point, N. J., as manager of the Intermediate Department until 1922. E. R. Squibb & Sons, New Brunswick, N. J., then claimed his services as factory manager. In 1926 he joined U. S. Rubber.

Besides being a Phi Beta Kappa man, Dr. Coleman was a member of Sigma XI and Gamma Alpha fraternities.

Funeral services were conducted in Ridgewood, N. J., November 9.

Survivors include his wife, two sisters, and a brother.

## New Rubber Plasticizer

RECOMMENDED by its manufacturer, The Beacon Co., 97 Bickford St., Boston, Mass., as of particular interest for use with Buna S or reclaimed stock is Plasticizer B, which is also said to give lasting durability to dead rubbers. The usual percentage used is 5-10% or less. Plasticizer B, it is claimed, works in very rapidly in milling and cures well. It has very little shrink.

# FINANCIAL

**American Cyanamid Co.**, New York, N. Y., and subsidiaries. First nine months, 1942: net income, $3,288,023, equal after preferred dividend requirements, to $1.10 each on 2,618,364 common shares outstanding, against $4,585,856, or $1.63 a share, in the same period of 1941; taxes, $10,600,000, against $7,871,709.

**American Zinc, Lead & Smelting Co.**, Columbus, O., and wholly owned subsidiaries. First nine months, 1942: net profit, $689,667, or 64¢ a common share, against $443,426, or 27¢ a share, last year.

**Anaconda Wire & Cable Co.**, New York, N. Y. Nine months to September 30, 1942: net income, $1,448,540, equal to $3.43 each on 421,981 capital shares outstanding, against $2,146,580, or $5.09 a share, last year.

**Baldwin Locomotive Works**, Philadelphia, Pa. Year ended September 30, 1942: consolidated net income, $4,239,257, equal, after preferred dividends, to $3.96 each on 1,028,488 common shares, compared with $2,728,103, or $2.49 a common share, in the preceding 12 months.

**Belden Mfg. Co.**, Chicago, Ill. Nine months to September 30: net income, $366,379, equal to $1.52 each on 241,547 shares, against $463,401, or $1.92 a share, last year.

**Boston Woven Hose & Rubber Co.**, Cambridge, Mass. Year ended August 31, 1942: net earnings, $595,798, equal, after preferred dividend requirements, to $6.40 a common share, contrasted with $616,912, or $6.65 a share, in the previous fiscal year; gross sales, $10,486,176, against $9,147,320; current assets, including cash of $655,546, $5,402,900, against $4,644,374, with $457,575 in cash; current liabilities, $1,220,760, against $797,558.

**Columbian Carbon Co.**, New York, N. Y., and subsidiaries. Nine months to September 30: net income, $2,141,000, after deducting $1,700,000 for federal income and excess profits taxes, equal to $3.98 each on 537,406 capital shares, against $2,540,968, or $4.73 a share, after taxes of $1,430,000 last year.

**Crown Cork & Seal Co.**, Baltimore, Md., and wholly owned domestic subsidiaries. First nine months ending September 30: net profit, $1,351,043, equal to $1.88 a common share, after preferred dividend requirements, against $2,614,260, or $4.32 a common share, in the same period last year; taxes, $2,132,126, against $1,772,666.

**E. I. du Pont de Nemours & Co., Inc.**, Wilmington, Del. First nine months, 1942: net income, $42,430,095, equivalent to $3.56 each on 11,108,941 common shares, after preferred dividends, compared with $68,253,664, or $5.84 a common share, in the same period last year; net sales, $368,968,021, against $350,936,844; federal taxes, $81,039,000, against $72,590,000.

**Electric Hose & Rubber Co.**, Wilmington, Del. Year to August 31: net profit, $164,227, against $204,512 in the previous fiscal year.

**Flintkote Co.**, New York, N. Y., and subsidiaries. Twelve weeks to October 10: net income, $424,575, equal, after preferred dividends, to 53¢ each on 713,706 common shares outstanding compared with $373,771, or 48¢ on 686,196 common shares, the twelve weeks to October 4, 1941; taxes, $1,029,597, against $765,598.

**General Cable Corp.**, New York, N. Y. Three months to September 30: net income after all expenses, taxes and other charges, $429,678, against $773,984 last year. Nine months to September 30: net income, $1,797,302.

**General Motors Corp.**, Detroit, Mich. First nine months, 1942: net profit, $83,562,119, equal, after preferred dividends, to $1.76 a common share, contrasted with $161,175,834, or $3.56 a share, for the corresponding 1941 period; net sales, $1,503,880,455, against $1,818,352,012.

**Hercules Powder Co.**, Wilmington, Del. Nine months ended September 30, 1942: net earnings, $3,143,457, equal, after preferred dividends, to $2.09 each on 1,316,710 common shares, against $4,356,632, or $3.01 a share, in the like period last year; federal taxes, $17,402,567, against $9,112,441; net sales, $85,290,589, against $58,940,341.

**Lea Fabrics, Inc.**, Newark, N. J. Year to May 31: net profit, $22,343, equal to 21¢ each on 104,970 shares, against $347,150, or $3.31 a share, in year ended May 31, 1941.

**Master Tire & Rubber Corp.**, Findlay, O. Nine months to September 30: net income, after $105,258 for taxes, $78,647.

**Monsanto Chemical Co.**, St. Louis, Mo., and domestic subsidiaries. First nine months, 1942: net income, $3,978,435, equal to $2.65 a common share, in contrast to $4,974,189, or $3.57 a share, in the corresponding 1941 period; net sales, $50,269,773, an increase of 7½% over the 1941 period.

**New Jersey Zinc Co.**, New York, N. Y. First nine months, 1942: net profit, $5,480,789, or $2.79 a share on 1,963,264 capital shares, after all provisions including $950,000 federal taxes, compared with $7,033,390, or $3.58 a share, for the corresponding time last year.

**Raybestos-Manhattan, Inc.**, Passaic, N. J., and domestic subsidiaries. Nine months to September 30: net profit, after $5,127,000 estimated provision for Federal income and excess profits taxes, $1,268,924, equal to $2.02 a share, against $1,745,894, or $2.78 a share, last year.

**S. S. White Dental Mfg. Co.**, Philadelphia, Pa. First nine months, 1942: net profit, $375,550, equal to $1.26 a share, against $401,625, or $1.36 a share in 1941.

**Rome Cable Corp.**, Rome, N. Y. Third quarter: net profit, $51,620, equal to 27¢ each on 189,830 capital shares, against $65,898, or 34¢ a share in the June quarter and $121,648, or 64¢ a share in the third quarter last year.

**Skelly Oil Co.**, Kansas City, Mo., and subsidiaries. First nine months, 1942: net income, $3,927,202, or $4 each on 981,348 common shares against $4,027,895, or $4.10 a share, for that period last year; taxes, $2,945,800, against $2,330,600.

**Thermoid Co.**, Trenton, N. J., and domestic subsidiaries. September quarter: net profit, $160,623, equal to 28¢ a common share, against $108,544, or 17¢ a common share, last year; taxes, $72,050, against $198,500.

**Timken Roller Bearing Co.**, Canton, O. First nine months, 1942: net profit, $4,780,955, or $1.98 a share, compared with $7,629,563, or $3.16 a share, for the same period in 1941.

**United Carbon Co.**, Charleston, W. Va., and subsidiaries. First nine months, 1942: net profit, $1,285,842, equal to $3.23 a share, compared with last year's $1,214,551, or $3.05 a share; federal taxes, $1,186,000, against $885,000.

# NEW ENGLAND

## Cabot to Produce "Furnace Type" Black

Godfrey L. Cabot, Inc., Boston, Mass., has announced that it has under construction in Oklahoma a new plant for the production of "furnace type" carbon black at the rate of 20,000,000 pounds a year. In addition, the company is getting ready to start construction of a second plant of equal capacity in Louisiana. The product of both these plants will be a semi-reenforcing type of black which has been found to be the most satisfactory general-purpose black for synthetic rubber compounding. Production from the first plant to be completed should be available in February 1943.

The Cabot company renewed its fellowship at Johns Hopkins University for the study of surface areas of finely divided substances. Prof. P. H. Emmett, in charge of the project, will be assisted by Robert B. Anderson, who took his doctorate in physical chemistry at the University of Iowa in June, 1942.

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**Rubbercraft Corp. of America**, Lincoln Bldg., New York, N. Y., has leased a plant in Wallingford, Conn., to manufacture rubber goods for the Navy. Officers of the new company are: president, Ralph M. Delaney; vice presidents, Bernard E. Pollack, Samuel Markle, and Milton G. Lederer, who is also general manager; treasurer, Henry W. Banks; secretary, Sidney Alderman.

# Rubber Reserve Co. Circulars

## Circular No. 1 (Revised) on the Distribution of Rubber

1. This Circular supersedes Circular No. 1,[1] dated September 12, 1941. Effective with permits issued authorizing the purchase of rubber for delivery during the month of June, 1942, and thereafter, all sales will be handled by D. D. Haldane, Distributing Agent, Rubber Reserve Co., 15 William St., New York, N. Y.

2. Rubber Reserve Co. will sell rubber to manufacturers ex dock or ex warehouse or F. O. B. cars at port of entry or ex warehouse at inland points at the option of Rubber Reserve Co. at the prices listed on the attached schedule; provided, however, that in the case of deliveries ex warehouse at an inland point, there will be added to the listed price an amount equivalent to the freight charges advanced by Rubber Reserve Co. in moving the rubber to such warehouse.

3. Rubber will be sold on a 10% examination and net test weight basis and payment therefor will be required at the time of delivery, by certified check payable to Rubber Reserve Co. It will, therefore, be necessary for manufacturers or their dealer agents to weigh and inspect at point of delivery. No adjustments will be made after delivery and acceptance. Rubber Reserve Co. will absorb the cost of the weighing and inspecting in all cases, but if delivery is made ex warehouse, the charge for reweighing and reinspecting shall not exceed 80¢ per ton. Title to the rubber passes upon the exchange of the Distributing Agent's delivery order or warehouse receipt for Buyer's certified check.

4. Requests for the purchase of rubber should be addressed to Sales Department, Rubber Reserve Co., 811 Vermont Ave., Washington, D. C., and must be mailed at least 30 days in advance of the date on which delivery is desired. Due to the necessity of maintaining a balanced inventory and in order to protect adequately the Government's stockpile it is doubtful that Rubber Reserve Co. will be in a position at all times to furnish manufacturers with the particular type and grade of rubber which is desired. In view of this fact, it is requested that in applying for purchase permits, the manufacturer indicate two alternate types and grades of rubber which will be acceptable in the event that it is not practicable to supply the particular type and grade which is desired. If it is the manufacturer's expectation that the delivery will be taken in several lots, a statement to this effect should be included in the request, indicating the quantities of each type and grade which are desired for each delivery.

5. The amount of rubber which Rubber Reserve Co. will sell to any manufacturer will be governed by the regulations of the War Production Board.

6. Upon receipt of the manufacturer's request, accompanied by the affidavit required under the provisions of Circular No. 3[2] dated January 31, 1942, Rubber Reserve Co. will issue and forward to the manufacturer, by Registered Mail, a Crude Rubber Purchase Permit, the form of which has been revised, in quadruplicate. If it is indicated in the request that delivery is desired in serveral lots, a permit will be issued to cover each delivery. The permit must be executed in quadruplicate and delivered to the Distributing Agent of Rubber Reserve Co. at the time the rubber is received. The quadruplicate copy, which will represent an invoice, will be returned to the manufacturer for its files.

7. In order that there may be the least possible dislocation in the usual channels of distribution, it is assumed that most manufacturers will prefer to have dealers act as their agents in purchasing rubber from Rubber Reserve Co., and in connection therewith, render certain services as has been the custom in the past, such as weighing, inspecting, shipping, and financing. However this procedure is not obligatory, and, should they so desire, manufacturers may arrange for their own deliveries, subject to the conditions contained in Paragraph 3.

8. In cases where the services of a dealer are utilized, the RUBBER MANUFACTURER'S ENDORSEMENT on the reverse side of the permit must be executed by the manufacturer, and the permit in quadruplicate forwarded to the respective dealer. The dealer will then present the permit to the Distributing Agent, who will arrange for the delivery of the rubber described therein. Upon receipt and acceptance of the rubber, the dealer will execute the ACCEPTANCE in quadruplicate and surrender the permit to the Distributing Agent, accompanied by a certified check covering the purchase price of the rubber. The Distributing Agent will then sign the permit in quadruplicate, in the space provided therefor, and deliver the quadruplicate copy thereof to the dealer for transmittal to the manufacturer.

9. Dealers who act as agents for manufacturers and reweigh and reinspect rubber at warehouses should, at the end of each month, render to the Distributing Agent an invoice covering charges for such services on the basis of not more than 80¢ per ton. The Distributing Agent will check the invoice against the deliveries and, if found to be correct, indicate his approval thereon and forward the invoice to Rubber Reserve Co. for payment.

10. The Rubber Trade Association of New York, Inc., has prepared the following schedule of fixed charges (exclusive of any charges for weighing and inspecting which will be absorbed by Rubber Reserve Co.) to be made by dealers when acting as agents for manufacturers:

750 Tons and over $\frac{3}{16}$¢ per pound...Cash 20 days
100 to 750 Tons $\frac{7}{32}$¢ per pound....Cash 30 days
30 to 99 Tons $\frac{1}{4}$¢ per pound.....Cash 30 days
10 to 29 Tons $\frac{1}{2}$¢ per pound.....Cash 30 days
Less than 10 Tons $\frac{3}{4}$¢ per pound...Cash 30 days
Case lots 2¢ per pound.....Cash 30 days

The foregoing charges (which are for the account of the manufacturer and not Rubber Reserve Co.) are intended to apply to the entire volume of rubber handled for any manufacturer during a single month, irrespective of the number of individual deliveries made or the number of dealers involved.

May 20, 1942.

[1] See INDIA RUBBER WORLD, June, 1942, pp. 253-54. Crude rubber selling prices appear on p. 254.
[2] *Ibid.*, July, 1942, pp. 362-64.

## Circular No. 6 on the Distribution of Liquid Latex to Manufacturers

1. Due to the necessity of protecting existing stocks of liquid latex, it is possible that in many instances purchase permits issued by Rubber Reserve Co. will designate the distributer from whom the material is to be secured, although the manufacturer to whom the permit is issued does not normally obtain its supplies from such distributer. Requests for the issuance of purchase permits, however, should state the name of the distributer from whom the manufacturer prefers to secure the material.

2. Effective June 1, 1942, all permits covering the purchase of liquid latex must be presented to a distributer within 30 days from the date of the permit, and delivery of the material covered thereby must be taken within 30 days thereafter. All purchase permits not completed by delivery within 60 days from the date of issuance thereof will be automatically cancelled.

3. Frequently, manufacturers have presented purchase permits to distributers and taken delivery of the material covered thereby in several lots. This practice must be discontinued, and a separate permit requested covering each delivery.

The form of Affidavit, Exhibit "B" should be complete in every detail, in order that there may be no delay in the issuance of the requested permit.

May 20, 1942.

## Circular No. 7 on the Distribution and Sale of Liquid Latex

1. In view of the need to make certain that stocks of Liquid Latex which are substandard or off quality, or which are in any danger of materially losing quality, are consumed before stocks which are better able to be stored for a long period, Rubber Reserve Co., effective September 1, 1942, will issue Purchase Permits for such material first. Although every effort will be made to supply manufacturers with the grade and quality of Liquid Latex they request, the immediate consumption of such stocks is of national importance and must be given first consideration. However, manufacturers will be furnished, in the discretion of Rubber Reserve Co., the nearest type of Liquid Latex which is practicable. Where the type or percentage of concentration of the Liquid Latex furnished is materially different from that requested, Rubber Reserve Co. will consider appeals from the manufacturer to whom the Purchase Permit is issued for a reconsideration of the Latex so assigned.

2. In order to facilitate the handling of manufacturers' requests for Purchase Permits, and in order to eliminate the necessity of correspondence in writing to Rubber Reserve Co. for a permit, and later in supplying an affidavit as to the manufacturers' inventory position, each manufacturer is requested to apply for permits in accordance with a new application form which contains a more complete description of the type of Liquid Latex desired, as well as the information required in the former affidavit. Such applications should be made exactly in the form of "Exhibit B" (Revised), a specimen copy of which

is attached hereto to be used only as a guide to the manufacturer in typing his own application.

3. It should be noted particularly that the new application form specifies Pounds Total Dry Latex Solids, and that the manufacturer should state whether the Liquid Latex required is normal, creamed, or centrifuged, should specify the percentage of concentration, should show the type of container, and should indicate the use to which the Liquid Latex will be put. In the application form a space is provided for the manufacturer to indicate his usual source of supply, although it is optional with the Rubber Reserve Co. as to whether the Purchase Permit will be filled from such source.

4. The following companies are authorized distributers of Rubber Reserve Co.:

American Anode, Inc., Akron, O.

Dunlop Tire & Rubber Corp., River Rd. and Sheridan Dr., Buffalo, N. Y.

Firestone Tire & Rubber Co., Akron, O.

General Latex & Chemical Co., 660 Main St., Cambridge, Mass.

Goodyear Tire & Rubber Co., Akron, O.

Heveatex Corp., 78 Goodyear Ave., Melrose, Mass.

Naugatuck Chemical Division of United States Rubber Co., 1230 Sixth Ave., New York, N. Y.

Revertex Corp. of America, 37-08 Northern Blvd., Long Island City, N. Y.

Charles T. Wilson Co., Inc., 120 Wall St., New York, N. Y.

Purchase Permits must be presented to the distributer indicated thereon within 30 days from the date thereof, and delivery of the material covered thereby must be taken within the monthly period specified on the Purchase Permit. All Purchase Permits not completed by delivery within 60 days from the date of issuance will be automatically cancelled. *Delivery must be taken in one lot, and separate permits will be required covering each delivery.* In requesting Purchase Permits this fact should be taken into consideration by the manufacturer.

5. Requests for Purchase Permits for Liquid Latex should be addressed to the Sales Department, Rubber Reserve Co., 811 Vermont Ave., Washington, D. C. It is emphasized that beginning with October deliveries, requests for Purchase Permits should be received at least 30 days in advance of the date on which delivery is desired in order to facilitate handling. Special service in connection with permits not requested 30 days in advance will be granted only in exceptional cases.

6. Re-useable drums owned by Rubber Reserve Co. will be stencilled to indicate governmental ownership thereof and, when empty, must be returned to the distributer handling the Purchase Permit, or to the destination designated by such distributer, at Rubber Reserve Co.'s expense.

7. Manufacturers who purchase Liquid Latex from Rubber Reserve Co. are expected to take every possible precaution to keep same in good condition, especially during winter months.

EXHIBIT "B" (REVISED)

APPLICATION TO RUBBER RESERVE COMPANY FOR LIQUID LATEX PURCHASE PERMIT

(A separate application must be submitted for each delivery desired)

I, ....., do hereby certify that I am ..... of .....;
(Title or Position) (Name of Manufacturer)

that said manufacturer will require Liquid Latex described as follows:

Type (indicate by X):
Normal..... Creamed..... Centrifuged.....
Pounds Total Dry Latex Solids.....
Percentage of Concentration.....
Type of Container.....
For Delivery in One Lot During the Month of ....., 194..
Indicate Specific Use.....
Usual Source of Supply.....

(in addition to present inventories of ..... pounds Total Dry Latex Solids) for consumption during the period from ....., 194.. to
(Month) (Day)
....., 194.. in the manufac-
(Month) (Day)

ture of products for the manufacture of which Liquid Latex may be used under the provisions of Supplementary Order No. M-15-b, as amended, issued by the War Production Board or other official instructions of the War Production Board; that such Liquid Latex, together with inventories of Liquid Latex now on hand, is to be used for the manufacture of such products and for no other purpose; that the amount of Liquid Latex which said manufacturer will use, consume or process during such period will not exceed the limitations upon the use, consumption or processing of Liquid Latex imposed by said Supplementary Order No. M-15-b, as amended, and any other instructions issued by the War Production Board. I further certify that delivery of the Liquid Latex applied for above will not result in total stocks of Liquid Latex on hand exceeding a practicable sixty day working inventory.

.....
(Signature)

Subscribed and sworn to before me this ..... day of ....., 194...

.....
(Notary Public)

August 31, 1942.

## Circular No. 8 on the Distribution and Sale of Guayule

1. Rubber Reserve Co. is now the sole importer and seller of Guayule rubber.

2. Manufacturers wishing to purchase Guayule should address requests for Purchase Permits to the Sales Department, Rubber Reserve Co., 811 Vermont Ave., N. W., Washington, D. C., at least 30 days prior to the date on which the manufacturer desires to take delivery of the material. When a manufacturer wishes to take delivery in more than one lot, the application for a Purchase Permit should so state. If a manufacturer purchases in carload lots, a separate application should be filed for each carload. Permits in quadruplicate will be forwarded to manufacturers by registered mail.

3. There is attached hereto a form of affidavit [1] which should accompany each application submitted by a manufacturer for a Purchase Permit. The affidavit must be completely executed in each instance, in order that there may be no delay in the issuance of the Purchase Permit.

4. In cases where manufacturers purchase Guayule in carload lots, the price will be 17½¢ per pound F.O.B. cars New York. If practicable, the material will be shipped direct from points at the Mexican border to the manufacturers' plants. In such instances, freight from New York to the manufacturers' plants will be included in the invoice for the material. Buyer shall have the option of selecting either shipping or receiving weights. If receiving weights do not exceed or fall short of the shipping weights by more than ¼ of 1%, then payment shall be effected on the basis of shipping weights; otherwise payment shall be effected on the basis of the actual receiving weight as verified by the manufacturer. In the case of carload lots, Rubber Reserve Co. will invoice the manufacturer, and payment shall be due ten days after date of invoice. Upon completion of delivery the original and duplicate copy of the Purchase Permit should be executed on the reverse sides thereof by the manufacturer and forwarded with a copy of the invoice and certified check payable to Rubber Reserve Co. to the Treasurer of Rubber Reserve Co. The remaining two copies of the permit may be retained by the manufacturer for its files.

5. When a Purchase Permit is issued for a quantity less than a carload, the material will be delivered to the manufacturer ex warehouse New York, or such other points as Rubber Reserve Co. may select, at a price of 18¢ per pound. Delivery of less than carload lots will be effected by Mr. D. D. Haldane, Distributing Agent, 15 William St., New York, N. Y., to the manufacturer's representative upon receipt of the Purchase Permit in quadruplicate properly indorsed, together with certified check to the order of the Rubber Reserve Co. In cases where the services of a New York dealer are utilized, the manufacturer's indorsement on the reverse of the Purchase Permit must be executed by the manufacturer and the Purchase Permit forwarded in quadruplicate to the respective dealer. The dealer will then present the Purchase Permit in quadruplicate to the Distributing Agent who will arrange for the delivery of the Guayule. Upon receipt and acceptance of the Guayule, the dealer will execute the acceptance in quadruplicate and surrender the Purchase Permit to the Distributing Agent accompanied by his certified check covering the purchase price of the Guayule. The Distributing Agent will then sign the permit in quadruplicate in the space provided therefor and deliver one copy thereof to the dealer for transmittal to the manufacturer. The original and remaining two copies will be retained by the Distributing Agent.

August 31, 1942.

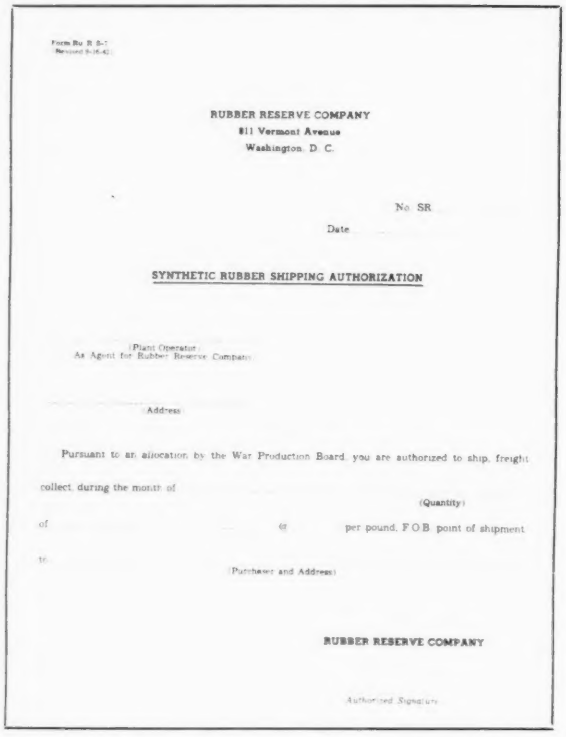
[1] No affidavit accompanied this order. EDITOR.

## Circular No. 9 on the Distribution of Synthetic Rubber Produced in Government Owned Plants

1. The War Production Board will, for the present, allocate all synthetic rubber produced in government owned plants, regardless of the quantity involved or the intended use therefor, and requests for this material should be addressed to Mr. R. F. Wolf, Synthetic Rubber Allocations Section, Rubber & Rubber Products Branch, War Production Board, Washington, D. C. No further requests for the purchase of synthetic rubber should be addressed to Rubber Reserve Co.

2. The foregoing rescinds the section of RUBBER AND RUBBER PRODUCTS BRANCH RELEASE ON THE COMPOUNDING OF BUTADIENE-STYRENE CO-POLYMER RUBBER, dated September 1, 1942, wherein manufacturers were advised that experimental quantities of synthetic rubber up to and including 200 pounds per month could be obtained without a War Production Board allocation by writing direct to Rubber Reserve Co.

3. Rubber Reserve Co. will sell Synthetic Rubber produced in government owned plants to consumers, as available, in accordance with allocation schedules issued by the War Production Board. For the time being, distribution of such rubber will be made by operators of synthetic rubber plants as Agents for Rubber Reserve Co., in accordance with Synthetic Rubber Shipping Authorizations, RuR Form S-7, a specimen of which is attached hereto. Copies of this form will be sent to the consumer and to the operator of the plant



Form Rw R 8-7
Revised 9-16-42

RUBBER RESERVE COMPANY
811 Vermont Avenue
Washington, D. C.

No. SR

Date

SYNTHETIC RUBBER SHIPPING AUTHORIZATION

(Plant Operator)
As Agent for Rubber Reserve Company

Address

Pursuant to an allocation by the War Production Board, you are authorized to ship, freight collect, during the month of

(Quantity)

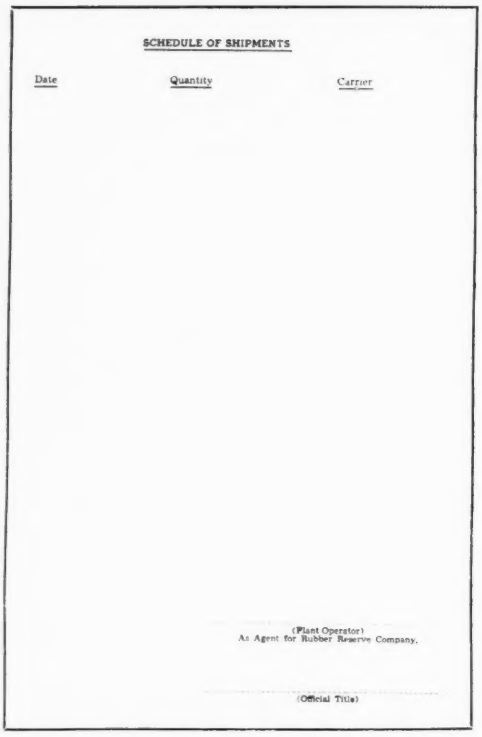
of at per pound, F.O.B. point of shipment

to

(Purchaser and Address)

RUBBER RESERVE COMPANY

Authorized Signature



SCHEDULE OF SHIPMENTS

Date Quantity Carrier

(Plant Operator)
As Agent for Rubber Reserve Company,

(Official Title)

which will make delivery of the material. Upon receipt of the Synthetic Rubber Shipping Authorization, the consumer should immediately execute and forward to the designated government plant operator a purchase order, in duplicate, accompanied by appropriate shipping instructions. This matter should receive prompt attention, since the Synthetic Rubber Shipping Authorization specifies the month during which the material will be shipped, and in the event that a purchase order is not received by the plant operator prior to the end of such month, the allocation and authorization are automatically cancelled.

### Buna S

4. This material is now available for sale from the production of plants operated by The Goodyear Tire & Rubber Co. and The Firestone Tire & Rubber Co., Akron, O.; and the United States Rubber Co., Naugatuck, Conn., as Agents for Rubber Reserve Co. Buna S Synthetic Rubber is sold at a price of 50¢ per pound, F.O.B. point of shipment, and the consumer will be invoiced for the material from this office. All invoices are payable within ten days from the date thereof.

### Neoprene GN

5. This material will be available for sale in October from the production of the plant operated by the E. I. du Pont de Nemours Co., Inc., Louisville, Ky., as Agent for Rubber Reserve Co. Neoprene GN will be sold at a price of 65¢ per pound, F.O.B. point of shipment, and the consumer will be invoiced for the material from this office. All invoices are payable within ten days from the date thereof.

### "Thiokol" and Butyl

6. Consumers will be advised when these types of synthetic are available for sale by Rubber Reserve Co.

7. The procedure covering the sale of synthetic rubber as outlined in Paragraph 3 hereof is purely of a temporary nature, and may be changed from time to time at the discretion of Rubber Reserve Co.

September 28, 1942.

## Circular No. 10 on Decreased Consumption of Higher Grades of Crude Rubber

1. It is essential that the grades of crude rubber considered most necessary to the war effort be conserved, and that the grades which are more susceptible to deterioration during storage be placed into production as rapidly as possible. In order to devise ways and means to achieve this result, officials of Rubber Reserve Co. recently conferred with a group of technicians composed of leading rubber industry compounders, and reviewed the governmental stockpile position by grades, to determine the steps necessary to increase the consumption of certain grades and simultaneously to decrease the consumption of more important grades.

2. As a result of the conference referred to above the following conclusions were agreed upon:

a. The lower grades of Browns and Blankets are much more susceptible to depreciation during storage, and it therefore becomes a problem of utilizing these grades in the near future.

b. All plantation grades may be used successfully with synthetic rubber, but the top grades may be used to slightly greater advantage.

c. Underesinated guayule may be used to good advantage with synthetic rubber in concentrations up to approximately 10%.

d. Wild rubber grades may be used to the same advantage with synthetic rubber as equivalent plantation grades.

e. A tabulation should be made showing the stockpile after setting aside a reserve of higher-grade rubbers for use with synthetic and for specialties, which will show the percentages of the various grades compared with the current rates of consumption. The tabulation should be furnished to all rubber manufacturers together with a letter urging them to increase the proportionate consumption of the lower-grade rubbers because they deteriorate in storage. Every effort should be made to consume a greater proportion of the Browns and the Blankets than exists in the stockpile, in order that these grades may be completely used up in a period of approximately eight months.

3. There is attached hereto a tabulation showing the percentage of crude rubber by grades in the government stockpile, as of August 31, 1942, after setting aside a reserve of the cleaner, high-grade rubbers which are best adapted for use with synthetic rubber and in the manufacture of specialties. The reserve so created will not be available for sale to any manufacturer for at least a year, and will not, therefore, be considered a part of the current stockpile.

The attached tabulation also reflects deliveries of crude rubber from the government stockpile in terms of percentages by grades, during the months of June, July, and August, 1942. Attention is called to the fact that a very substantial portion of lower grades of Browns and Blankets should be consumed as early as possible, and manufacturers should, therefore, request permits for these grades wherever practicable.

4. Rubber Reserve Co. concurred in the suggestion made by the technicians hereinbefore referred to that the rubber manufacturing industry should be afforded an opportunity to cooperate voluntarily by increasing the use of lower grades and sharply curtailing requests for the higher grades which must be conserved. Failing to accomplish the desired result in this manner,

it will be necessary to adopt a system whereby requests for purchase permits will be filled by Rubber Reserve Co. at its own discretion, irrespective of the grade specified. It is believed, however, that the rubber manufacturing industry, in view of the information reflected in the attached grade schedule and the conclusions set forth in Paragraph 2 of this circular, will endeavor immediately to arrange its compounding operations so that a larger percentage of Browns and Blankets will be placed into production.

5. The future supply picture will show an increased proportion of wild rubber and guayule, and manufacturers are urged to give every consideration to the use of a larger percentage of these rubbers in their compounding programs. The advantages of underesinated guayule for admixing with synthetic rubber deserve particular study.

CRUDE RUBBER STOCKPILE AS OF 8/31/42 AND DELIVERIES FOR JUNE-JULY-AUGUST

| Grade | Total Deliveries for June-July-August % | Stock on Hand August 31, 1942 % |
|---|---|---|
| 1X Ribbed Smoked Sheet | 30.62 | 20.23 |
| 1 Ribbed Smoked Sheet | 11.32 | 12.47 |
| 2 Ribbed Smoked Sheet | 12.47 | 8.48 |
| 3 Ribbed Smoked Sheet | 11.54 | 7.01 |
| 4 Ribbed Smoked Sheet | 6.28 | 6.34 |
| 5 Ribbed Smoked Sheet | 3.29 | 3.27 |
| Claro Brand | 0 | .06 |
| 1X R.S.S. Trimmings | .44 | .12 |
| R.C.M.A. Crepe | .02 | .05 |
| Sole Crepe & Trimmings | | .15 |
| 1X Thick Pale Crepe | .05 | 1.84 |
| 1 Thick Pale Crepe | .21 | .51 |
| 2 Thick Pale Crepe | .09 | .06 |
| 3 Thick Pale Crepe | 0 | .05 |
| 1X Thin Pale Crepe | 1.31 | 4.80 |
| 1 Thin Pale Crepe | .75 | 2.75 |
| 2 Thin Pale Crepe | .80 | .64 |
| 3 Thin Pale Crepe | .01 | .05 |
| 1X Thick Brown Crepe | .03 | .01 |
| 2X Thick Brown Crepe | .13 | .19 |
| 3X Thick Brown Crepe | .03 | .12 |
| 1X Thin Brown Crepe | .94 | 1.63 |
| 2X Thin Brown Crepe | .65 | 1.43 |
| 3X Thin Brown Crepe | .37 | .71 |
| 1 Thin Brown Remilled Crepe | .15 | .34 |
| 2 Thin Brown Remilled Crepe | 2.84 | 3.17 |
| 3 Thin Brown Remilled Crepe | 2.64 | 3.03 |
| 4 Thin Brown Remilled Crepe | 2.51 | 3.36 |
| Roll Brown/Flat Bark | 1.36 | 3.36 |
| 1 Blanket Crepe | | .04 |
| 2 Blanket Crepe | .70 | .87 |
| 3 Blanket Crepe | 6.71 | 7.32 |
| 4 Blanket Crepe | .80 | 1.84 |
| 1 Smoked Blanket | .80 | 1.09 |
| 2 Smoked Blanket | .24 | 1.19 |
| 3 Smoked Blanket | | .02 |
| Africans | | .14 |
| Sprayed Rubber | | .01 |
| Wild Rubber | .01 | .80 |
| Unknown | 0 | .65 |
| Total Stockpile | 100% | 100% |

September 23, 1942.

## Circular No. 11 on Balata

1. Until further notice, Rubber Reserve Co. will sell Balata to manufacturers ex dock or ex warehouse at port of entry or F.O.B. cars at port of entry or ex warehouse at any inland point at the option of Rubber Reserve Co., at the prices listed on the attached schedule; provided, however, that in the case of sales ex warehouse at an inland point, there will be added to the listed price an amount equivalent to the freight charges advanced by Rubber Reserve Co. in moving the Balata to such warehouse.

2. All sales will be handled by D. D. Haldane, Distributing Agent, Rubber Reserve Co., 15 William St., New York, N. Y. Balata will be sold on a 100% gross weight and 10% net test tare basis, and payment in the form of a certified check payable to Rubber Reserve Co. will be required at the time of delivery. It will, therefore, be necessary for manufacturers or their dealer agents to inspect at point of delivery. No adjustments will be made after delivery and acceptance. A certified public weigher will be appointed by the Distributing Agent, and the cost of weighing will be absorbed by Rubber Reserve Co. Title to the Balata shall pass upon the exchange of the Distributing Agent's delivery order or warehouse receipt for Buyer's certified check.

3. Applications for the purchase of Balata should be addressed to Sales Department, Rubber Reserve Co., 811 Vermont Ave., Washington, D. C., and must be mailed at least 30 days in advance of the date on which delivery is desired. Due to the necessity of maintaining a balanced inventory and in order to protect adequately the Government's stockpile from excessive deterioration it is doubtful that Rubber Reserve Co. will be in a position at all times to furnish manufacturers with the particular type and grade of Balata which is desired. Therefore, in applying for purchase permits, the manufacturer should indicate two alternate types and grades of Balata which will be acceptable in the event that it is not practicable to supply the particular type and grade which is desired. If it is the manufacturer's expectation that delivery will be taken in several lots a separate application should be submitted for the Balata desired for each delivery.

4. The amount of Balata which Rubber Reserve Co. will sell to any manufacturer will be governed by the regulations of the War Production Board.

5. Upon receipt and approval of the manufacturer's application in the form of the specimen copy attached, Rubber Reserve Co. will issue and forward to the manufacturer, by registered mail, a Balata Purchase Permit in quadruplicate. The permit must be executed in quadruplicate and delivered to the Distributing Agent of Rubber Reserve Co. at the time the Balata is received. The quadruplicate copy, which will represent an invoice, will be returned to the manufacturer for its files.

6. In order that there may be the least possible dislocation in the usual channels of distribution, it is assumed that most manufacturers will prefer to have dealers act as their agents in purchasing Balata from Rubber Reserve Co., and in connection therewith, render certain services as has been the custom in the past, such as inspecting, shipping and financing. However this procedure is not obligatory, and, should they so desire, manufacturers may arrange for their own deliveries, subject to the conditions contained in Paragraph 2.

7. In cases where the services of a dealer are utilized, the MANUFACTURER'S ENDORSEMENT on the reverse side of the permit must be executed by the manufacturer, and the permit in quadruplicate forwarded to the respective dealer. The dealer will then present the permit to the Distributing Agent, who will arrange for the delivery of the Balata described therein. Upon receipt and acceptance of the Balata, the dealer will execute the ACCEPTANCE in quadruplicate and surrender the permit to the Distributing Agent, accompanied by a certified check covering the purchase price of the Balata, plus freight charges, if any, incurred in moving the Balata to inland warehouse. The Distributing Agent will then sign the permit in quadruplicate, in the space provided therefor, and deliver the quadruplicate copy thereof to the dealer for transmittal to the manufacturer.

RUBBER RESERVE CO. BALATA SELLING PRICES

(Ex dock or ex warehouse at port of entry or F.O.B. cars at port of entry or ex warehouse at any inland point at the option of Rubber Reserve Co.)

| Grade | Price in ¢ per Lb. |
|---|---|
| Surinam Sheet | 81 |
| Venezuelan Block | 73 |
| Prime Manaos Block | 71 |
| Colombian Block | 68 |
| Panama Block | 71 |
| Peruvian Prime (Rosada) | 70 |
| Chicken Wire | 52 |
| Coquirana Washed And Dried (Aniba) | 55 |
| Coquirana Crude (Aniba) | 45 |
| Peruvian F.A.Q. (White) | 35 |
| Massaranduba Washed | 49½ |
| Massaranduba Crude | 35 |

APPLICATION TO RUBBER RESERVE CO. FOR BALATA PURCHASE PERMIT

I, ....., do hereby certify that I am
(Name)
..... of .....;
(Title or Position) (Name of Manufacturer)
that said manufacturer will require .....
tons of ..... Balata to be
(Grade)
delivered in one lot during the month of ..... 194.. to ..... of ..... tons of Balata now on hand) for consumption during the period from .....
(Month)
..... 194.. to .....
(Day) (Month) (Day)
194.., for the manufacture of products in the manufacture of which Balata may be used under the provisions of Supplementary Order No. M-15-b, as amended, issued by the War Production Board or other official instructions of the War Production Board; that such Balata, together with inventories of Balata now on hand, is to be used for the manufacture of such products and for no other purpose; that the amount of Balata which said manufacturer will use, consume or process during such period will not exceed the limitations upon the use, consumption or processing of Balata imposed by said Supplementary Order No. M-15-b, as amended, and any other instructions issued by the War Production Board. I further certify that delivery of the Balata applied for above will not result in total stocks of Balata on hand exceeding a practicable sixty day working inventory.

.....
(Signature)
Subscribed and sworn to before me this ..... day of ....., 194...

.....
(Notary Public)

September 30, 1942.

## Circular No. 12 (Amending Circular No. 11)

In accordance with the procedure outlined in our Circular No. 11, Rubber Reserve Co., until December 31, 1942, will sell Balata to manufacturers, ex dock or ex warehouse at port of entry or F.O.B. cars at port of entry or ex warehouse at any inland points at the option of Rubber Reserve Co. on the basis of the prices listed in the attached schedule, provided, however, that in the case of sales, ex warehouse at any inland point, there will be added to the listed price an amount equivalent to the freight charges advanced by Rubber Reserve Co. in moving the Balata to such warehouse.

In instances where consumers wish to avail themselves of the services of dealers in the weighing, inspecting, and forwarding of Balata to the consumers' plant, they are, of course, privileged to do so, and the Rubber Trade Association of New York have informed us that charges for such servicing will be as follows:

30 tons and over—½¢ per lb. Cash 30 days net
15 tons and less than 30 tons—¾¢ per lb. Cash 30 days net
10 tons and less than 15 tons—2¢ per lb. Cash 30 days net
5 tons and less than 10 tons—2½¢ per lb. Cash 30 days net
1 ton and less than 5 tons—3¢ per lb. Cash 30 days net
Case lots—less than 1 ton—5¢ per lb. Cash 30 days net

(Continued on page 316)

# EUROPE

## GREAT BRITAIN

### Wartime Rubber Footwear Repairs

At this time, when protection against rain and snow is most urgently needed, the problem of obtaining rubber footwear assumes special importance. The shortage of rubber has led to the prohibition of the manufacture of certain types of footwear altogether, for instance the popular Wellingtons, and manufacture of other types has been restricted so that dealers frequently run short of supplies. A new type of rubber boot is now on the market which has canvas uppers and requires only two clothing ration coupons instead of the four needed for the usual kinds; this helps the retailer because he can obtain two pairs of the new rubber boots by turning in four coupons, whereas the customer can obtain only one pair, whether he gives up two or four coupons.

It is estimated that in the current year fewer than 1,000,000 pairs of rubber boots are being made, against peacetime requirements of more than 2,000,000 pairs a year. There is therefore great need of facilities for getting rubber footwear repaired, especially the heavier type of boots used by workers on farms, in factories, etc. This need is being met to some extent by the establishment of the National Boot Repair Service, with headquarters in Manchester, which is working at the suggestion of the Ministry of Supply. The chief function of this organization seems to be to send the necessary rubber parts to the various repair shops and factories in the country. It is figured that 1,000,000 pairs of workers' boots could be collected for repair throughout the country, and it seems that one factory in Manchester is equipped to handle 15,000 pairs a week.

At this factory the boots, on arrival, are inspected to determine the kind of repair required, and if it is a question of new heels and soles, the boots are passed on to men who cut off the unwanted old rubber with slicing knives. This work cannot be done by girls as the strain on fingers and wrists is said to be very great. The rubber thus cut off is sent to the reclaimers. The surfaces are then buffed on a revolving carborundum by girls, and other girls apply cement and attach the new soles and heels which have been cut from soling sheet with a cleated design. The boots are then sent to a vulcanizing chamber by the trolley-load and, when finished, are paired off, again inspected, and returned to their owners. The heels and soles are cut in all sizes for men and women, and the special design is intended to provide a good grip on slippery ground or on factory floors. At present, work in this factory is chiefly concentrated on repairs of boots for Navy, Army, and Air Forces, and heavy-duty boots for industrial and farm workers.

Because of the great interest in rubber footwear repairs by the general public, the trade papers have at various times published articles describing suitable methods, some of them simple enough for the individual to carry out himself in his own home. The essentials may be summarized as follows: unwanted old rubber on the worn sole or heel is trimmed away; the worn surface as well as that of the repair piece is roughed and thoroughly brushed to remove dust and any adhering particles; then self-curing solutions, which appear to be easily obtainable, are applied on both the new and the old surface, and allowed to dry for several hours; next a second solution, known as the activator, is spread on one surface only, and this is allowed to dry for a few minutes before the parts are put together.

If the new soles and heels have to be cut from soling material, a larger size must be cut than seems necessary since it is very difficult to fit the solutioned parts exactly and once put together, they cannot be separated again without damage; any excess can be cut off later on. Now the soles and heels are firmly secured in place by rolling, hammering, or pressure in a cement press, and the boot is allow to stand for another three or four hours to enable the activator to complete its work, after which the edges are rounded and lightly buffed.

If the sole is not merely worn, but the canvas is exposed, or if there is a hole, the preliminaries are somewhat more complicated, since it is necessary first to mend the broken part and build it up to the level of the surrounding surface by means of impregnated canvas and scrap soling material.

### Heavene and its Implications

The conclusion of the series on "The Rubber Age Emergency Reclaim Plan" by F. N. Pickett, which has been appearing in the London *Rubber Age*, mentions a solvent distilled from scrap rubber and known as Heavene and of the possibilities of the more volatile solvents obtainable from scrap and plantation rubber. About 1934, when the rubber slump caused the price of the commodity to drop to unheard-of depths, Mr. Pickett developed a process of distilling rubber scrap, producing two fractions, those below 150° C. and those above. The more volatile fractions were rectified and refined, and the heavier fractions, later marketed as Heavene, were used as a softening agent in reclaiming. At the time the volatile solvent could be produced at prices below those current for naphthas and benzenes; furthermore they had the advantage of being practically non-toxic and did not irritate the skin.

Mr. Pickett states that in the earlier experimental days, a very volatile fraction, boiling at atmospheric temperature, was recovered with the aid of activated carbon, which the chemists in his works pronounced to be isoprene, and some very interesting work was done in what is now known to be polymerization into synthetic rubbers. Chemists, he continues, quite frequently polymerized the full solvent, sometimes inadvertently, and obtained some curious products, many of which resembled present-day polymers. However since no immediate use was seen for these products, investigation in this direction was discontinued.

The work carried out in 1934, concludes Mr. Pickett, leaves very little doubt that a large part of the products of distillation of plantation rubber could be cracked down to isoprenes and other work suggests that the distillate of rubber itself or the products of depolymerized rubber could be again polymerized, perhaps with copolymers. If it is true, he says, that plantation rubber can, if necessary, be produced at 1d. per pound, then one day a plantation might hold its own as a source of products possessing all the advantages of synthetic rubbers and costing less to produce than synthetic rubber from petroleum.

### Company Notes

After providing for various taxes the Leyland & Birmingham Rubber Co., Ltd., booked net profits of £95,863 for the 12 months ending June 30, 1942, as compared with £99,478 for the 1940-41 period. As in the preceding year, total dividends of 10% on ordinary shares and a bonus of 2½% were turned out, leaving £52,690 to be carried forward, against £37,827.

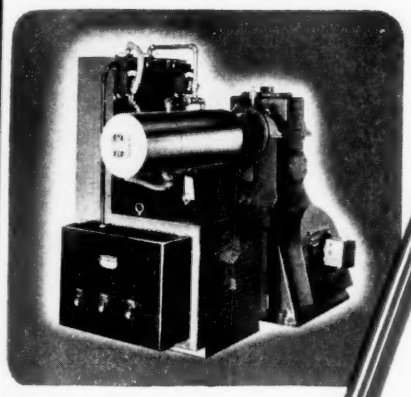
Celanese Plastics Development, Ltd., has newly been formed with a capital of £300,000, to manufacture, import, export, and deal in plastics and synthetic resins of all kinds, and to carry out research work. The board consists of Sir John Wardlaw-Milne, chairman Sir Harold Webbe, J. H. Rooney, G. Rudorf, and N. A. C. Friend. The new concern is a subsidiary of British Celanese, Ltd., which together with the Celanese Corp. of America and Canadian Celanese, Ltd., have during the past ten years spent considerable sums on research. The field of plastics has been receiving increasing attention, and since the war research in this direction has been intensified, leading to new developments which are making Britain more independent of certain raw materials. In view, therefore, of the growing importance of these products, British Celanese, Ltd., decided to form a subsidiary which will be chiefly occupied in extending output of various types of plastics.

## GERMANY

A valuable property of the non-vulcanizable synthetic products is the comparative ease with which they may be combined with other materials including natural and synthetic rubber, thus making it possible to obtain a whole series of modifications with

# Extrusion on the way?

# It's HERE!



On the record, the extrusion of plastics has "come of age." More than 50 manufacturers are today successfully extruding thermoplastics for war uses—using such materials as:

**Acrylic Resins** — **Vinyl Resins**
**Styrene Resins** — **Ethyl Cellulose**
**Vinylidene Resins** — **Cellulose Acetate**
**Cellulose Acetate-Butyrate**

Engineering service, pioneered in this field by National Rubber Machinery Company, and perfected by actual trial runs in its modern Pilot Plant, has served to eliminate guesswork and costly delays. Machines are built for the specific plastic and the needs of the job. By changing the production characteristics, or by selecting suitable non-corrosive materials, production is speeded up and operating costs reduced.

Almost any shape or cross-section can be produced by extrusion, continuously, economically and with practically no waste. That's the reason more and more National extruders are being engineered and installed for production of war-essential plastics. That's why many other farsighted fabricators are laying their post-war plans to include the extrusion of plastics for architectural shapes, cabinets, furniture, venetian blinds, decorative wall strips, borders for flooring, tubing, cylindrical containers of small diameter.

If you want complete facts on plastics extrusion, a National engineer will be glad to tell you of actual installations, discuss the possibilities for your product, and arrange for a trial production run in our Pilot Plant.

**NATIONAL RUBBER MACHINERY COMPANY**
General Offices: Akron, Ohio

*CREATIVE ENGINEERING*

special properties for which specific uses can be found. The most suitable of such products are the Oppanols and the Plexigums. The addition of Oppanols, particularly those with molecular weight of 15,000 to 50,000, has the effect of retarding crystallization in substances having a tendency to crystallize; they further serve as plastifiers and also prolong the fluid state of materials inclined to solidify in cold. Thus the point at which certain bitumens solidify in cold can be lowered and the drip point raised, while the elasticity is increased; paraffin can be rendered soft and flexible, and the softness and extensibility of non-resinous gutta percha can be improved.

The combination of Oppanol B with natural or other synthetic rubbers is on the whole more valuable from the standpoint of improving the Oppanol rather than the other rubbers. The addition of a small amount of rubber decreases the cold flow of Oppanol B and gives it greater mechanical strength. But the addition of Oppanol to rubber mixes does help increase resistance to aging, water, and cold, but at the cost of lowered mechanical strength and elasticity, which decrease as the proportion of Oppanol increases. Still, with suitable compounding it is possible to obtain fairly good properties; thus a mix of 50 parts natural rubber, 25 parts Oppanol B (molecular weight 200,000) and 20 parts kaolin plus other ingredients, gave tensile strength of 190 kg/cm, elongation at break 640%, rebound elasticity 40%, and Shore hardness, 50%.

Natural rubber compounds can be made resistant to ozone by adding Oppanol B, but to obtain outstanding results the Oppanol content must exceed the rubber. In a comparative test, tubing made with 10% natural rubber and 15% Oppanol B (molecular weight 200,000) and similar tubing made with 25% rubber and no Oppanol were exposed to a current of air containing ozone. The all-rubber tubing showed numerous cracks after exposure of 15 minutes; whereas exposure of 24 hours apparently had no effect on the Oppanol plus rubber tubing.

Oppanol in rubber or Buna improves the dielectric properties of the rubbers.

The polymerizates based on acryl combinations and known as Plexigums have been found most useful in mixtures with synthetic rubber, particularly with Perbunan. The addition of Plexigum to Perbunan facilitates milling and extrusion to an extraordinary degree, but not only is processing benefited, but in various respects the quality also. Tests show resistance to light is improved to such an extent that cracks due to light are practically eliminated in either stretched or flexed cable covers.

There is greater resistance to oil, especially if Plexigum BB is used; while the influence on aging due to heat is outstanding. In a test which ran for more than 190 days a Perbunan-Plexigum mix was exposed to a temperature of more than 100° C.; a slight, but distinct alteration was noted in the mass tending to a decrease in elongation and increase in tensile. The change came to a standstill after 150 days, and further heating had no effect at all on the properties.

Mixes of Perbunan and Plexigum are especially useful as covers for marine cables.

Plexigum in the form of a latex has been used to replace Revertex wholly or in part in the production of double-textured fabrics for the footwear industry where it has been used as an extender for Revertex.

It will be of interest to add the results of tests made in Germany on the effect of rubber-like high polymers on the physical properties of bunas. For this purpose two basic compounds were first prepared—the one an insulation mix with 33% Buna S and no carbon black, but with suitable accelerators and antiagers to counteract the tendency of this material to cyclize further and harden during vulcanization; and the other—a cable cover mix containing 33% Perbunan and 5.3% Durex carbon black. From these, samples were made in which one-third of the Buna S or Perbunan was replaced by Oppanol B, Oppanol C, Plexigum B, and Plexigum D, respectively. The plasticity tests made before vulcanization clearly demonstrated the beneficial effect of the thermoplasts on milling and extrusion properties. Tensile and elongation values decreased greatly, but this is not important in compounds intended for insulations and covers for cables.

In regard to the Perbunan plus thermoplast samples, aging at 70° C. for seven days resulted in very little change in any of the samples, but effects were much more marked when tests were carried out at 100° C. for 14 days. In almost all cases there was a large increase in tensile and more or less definite decrease

**NOTICE:** While we are permitted to sell up to 200 pounds per month to customers conducting certain types of experimental work . . . all regular allocations of Perbunan synthetic rubber are now made by the Rubber and Rubber Products Branch of the War Production Board.


# PERBUNAN
**resists oil unusually well!**

# PERBUNAN
**has exceptional resistance to heat or cold!**

# PERBUNAN
**has an especially long life!**

Write **STANCO DISTRIBUTORS, INC.** 26 BROADWAY, NEW YORK CITY
Warehouse stocks in New Jersey, Louisiana and California

in elongation at break, as compared with the original values of these compounds, except in the case of the sample containing Plexigum B. Here the increase in tensile was only 15% as compared with 30% in the basic mix. In other words the Plexigum B plus Perbunan compound was the least affected by and hence the most resistant to aging and temperature. In the oxygen-aging experiments the test was continued for seven days at 70° C. and 21 atmospheres oxygen and caused no notable changes; thus it is concluded that aging phenomena are due not to oxidation but to temperature.

The Buna S plus themoplast mixes showed a somewhat different picture; all the values of the basic mix were somewhat lower than those of the basic Perbunan mix, probably owing to the absence of carbon black, and no anti-aging effect was noted. The difference on the chemical constitution of the two types of synthetic rubber is hereby evidenced.

The influence of the thermoplasts on the dielectric properties of the synthetic rubbers varied widely and brought some surprises. Thus, because of the excellent dielectric properties of pure Oppanol B, a great improvement in this direction had been looked for in the mixes with Buna S, but results proved to be considerably below those expected. At the same time the Plexigums were found to have a definitely deteriorating effect on these properties of Buna S mixes. By contrast, all the thermoplasts improved the dielectric properties of Perbunan.

The presence of the thermoplasts greatly heightened the ozone resistance of all samples; Buna S is naturally more sensitive to ozone than Perbunan, and the protective effect of the thermoplasts on this rubber was consequently more striking. As to improvement of oil resistance, Plexigum on the whole acted more favorably than Oppanol.

The following table illustrates the influence of the thermoplasts on various properties of Buna S and Perbunan:

| | Buna S | | Perbunan | |
|---|---|---|---|---|
| | Oppanol | Plexigum | Oppanol | Plexigum |
| Tensile Strength | − | − | − | − |
| Temperature and aging | 0 | 0 | 0 | + |
| Heat-pressure resistance | − | 0 | − | 0 |
| Ozone resistance | + | + | + | + |
| Transformer oil | + or − | + | − | 0 |
| Petroleum | − | + | − | + |
| Tar oil | + | + | + | + |
| Dielectric loss | + | − | + | + |
| Specific insulation resistance | − | − | + | + |

0 signifies no effect; + means improvement; and − means deterioration.
* No tests made.

# ITALY

The large amount of lignin available has for years challenged the ingenuity of investigators who have searched for ways of utilizing it. In America and, according to press notices, now in Italy also, positive results have been obtained in producing plastics from lignin. The Royal Institute of Industrial Chemistry and the Research Laboratory of the S. A. Edoardo Pessi, Padua, announce that successful experiments have been made with lignin obtained after treating wood with alkali.

Lignin, so derived, and if produced in a pure state, yields a material which, though it has some of the properties of thermoplasts, is so brittle that it is useless for practical purposes. However it is known that lignin readily reacts with phenol, furfural, and aniline, especially at elevated temperatures. Consequently a method was developed whereby the lignin was precipitated in the presence of phenol. The resultant product is a black resin that can be mixed with wood flour and rolled and pressed in the usual way. The plastic thus obtained is claimed to have mechanical properties superior to those of phenol-lignin products earlier obtained abroad.

Some of the phenol-lignin compounds react with formaldehyde in both acid and alkaline media and yield plastic materials of the greatest interest, and articles manufactured from such plastics are said to have properties comparable with those of phenol-formaldehyde resins; while if the lignin reaction products are carefully selected, properties are obtainable equal to those of normal phenol resin.

The lignin-phenol products have a hard shiny surface, are black in color, though a dull red or green is also possible, and are considered to have great possibilities. Their chief advantage lies in the fact that they are very cheap to produce because of the considerable saving possible by the large proportion of phenol that can be replaced by lignin.

These lignin products have been compared with those produced in America from lignin obtained from sulphite liquor, and it is claimed that orientation tests revealed that the Italian products have a far higher resistance to water than the American product, which was found to have only slight resistance to water.

Experiments with lignin-aniline, and lignin-aniline-formaldehyde compounds are also said to be under way and so far have given very promising results.

According to the *Chemical Trade Journal*, the Societe per la Producione della Gomma Sintetica plans to produce synthetic rubber by a German process which has as the basic raw material brown coal or lignite. The company is said to be building a factory at Terni for this purpose and proposes to produce 12,000 tons annually when the factory starts operating next year.

Incidentally, the same source learns that the Societa Anonima Industria Gomma Sintetica has built a plant at Ferrara to produce 6,000 tons of synthetic rubber annually from alcohol.

# SWEDEN

Gosta Ehrensvard, a young Swedish chemist, has developed a process of making artificial rubber from wood products, a Swedish source learns. The material, it appears, can be vulcanized and, though not suitable for automobile tires, is useful for bicycle tires, heels, and plastic products. An experimental factory has been opened in Gislaved by the Swedish Co-operative Association, and eventually a full-sized factory will be built to manufacture Telax, as the new product has been named.

Sweden has of late been actively engaged in attempting to solve the problem of obtaining rubber. It will be remembered that some months ago Professor The Svedberg, Noble Prize winner and head of the Physical-Chemical Institute of the University of Uppsala, showed samples of synthetic rubber produced in his laboratories by an independent method, from calcium carbide. Now it is learned that experiments in obtaining rubber from Russian dandelion are being conducted by scientists of the Svalov experimental plant-breeding Station in Skane, Southern Sweden.

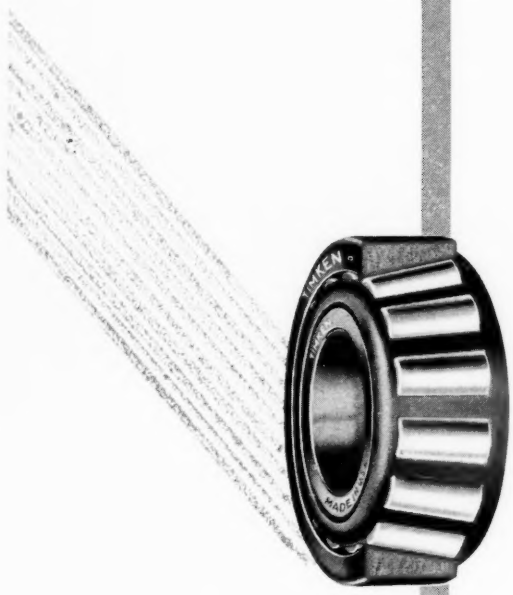
# FAR EAST

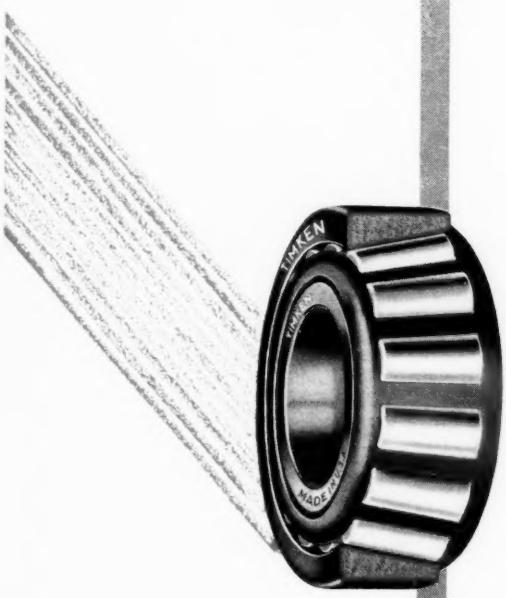
## CEYLON

Rubber exports from Ceylon during 1941 were 90,919 tons, according to the annual report of the Colombo Rubber Traders' Association. The figure is under the 92,861 tons of official returns, and both are well below the quota of 109,000 tons for the year. Exports for the first half of 1941 totaled 43,427 tons, and in the second half, 47,492 tons, nothing like the 20% extra that the colony was asked to produce.

It seems that the poor response was due to unfavorable weather from June to October which hampered production and also to the lack of proper supervision because all male Europeans between 18 and 41 were enrolled in the local defense forces; finally labor unrest not only interfered with production, but also, and to a very serious degree, with the handling of ships.

In July an export duty of 2½ cents (Ceylon currency) per pound was imposed on raw rubber.

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# INDIA

The rubber export quota for British India for the third quarter of 1942 was fixed at 5,325 tons, or 110% of the basic quota for the period.

South India has hitherto not figured as an important producer of raw rubber, but in the present emergency all sources, however meager, deserve consideration. Because of climatic conditions and the prevalence of *phythopthora* leaf disease the yield per acre of Indian rubber estates has always been considerably below those of estates of the same age in other parts of the Far East. In certain sections of South India, however, conditions appear more favorable, and outputs per tree per annum have been obtained which compare well with those obtained in other countries from trees of the same age.

The report of the Vaikundan Co. (Travancore) states that last year old rubber, planted in 1914, yielded 631 pounds per acre, against 607 pounds in the preceding year; unselected rubber planted in 1927 produced 577 pounds, and 459 pounds per acre were harvested from a 1927 area. These are very good yields for ordinary seedling trees. The estate has also certain bud-grafted areas reported to be progressing very satisfactorily. A 1928 clearing of 13 acres of buddings, eight acres of clonal seed, and a certain area under ordinary seedlings, together yielded 775 pounds per acre, against 638 pounds in 1940 and 547 pounds in 1929. Another section, planted entirely with bud-grafts in 1929, yielded 840 pounds an acre in the third year of tapping, an increase of 302 pounds over the previous season.

# AUSTRALIA

Australia has not been idle while experts in other parts of the world have been wrestling with the problem of finding rubber sources to take the place of the vast *Hevea* plantations of the Far East, now in enemy hands. In addition to experiments made with Russian dandelion, which supplies *kok sagyz* rubber, tests have also been made by the Department of Agriculture in Queensland with various tropical plants, and some success is reported.

It seems that the most promising plant found so far is *cryptostegia grandiflora*, or the Madagascar rubber vine. The plant is said to grow wild in Australia, with about 7,000 acres of it in three localities; and there is no lack of suitable land in Northern Queensland for planting further extensive areas, which, incidentally, could for the most part be done mechanically. Experts calculate that an acre of the *cryptostegia* would yield 70 to 100 pounds of raw rubber annually and that 1,000,000 acres would produce 31,000 to 40,000 tons, which should be more than enough to cover Australia's needs. Before the war Australia required about 16,000 tons of rubber annually.

Meanwhile Australia is also exploiting another source of rubber. In the neighborhood of Port Moresby, New Guinea, rubber plantations totaling about 13,000 acres have been put in charge of special army officers with planting experience. Their duty is to see that the thousands of estate laborers produce the maximum amount of rubber as speedily as possible. The trees appear to be ordinary seedling rubber capable of yielding at least 300 pounds an acre and up to 400 pounds or more per acre. It is expected that the intensive exploitation now in progress will result in a yield of 2,000 tons for the year—provided circumstances permit tapping to continue for that period.

# SOUTH AFRICA

In the Union of South Africa steps are being taken to provide an adequate supply of locally produced reclaimed rubber. Various reclaiming plants have been set up and are coming into production. The Controller of Rubber has issued regulations prohibiting the destruction or use of old tires and tubes without special permit, thus helping to insure that adequate supplies of scrap for reclaiming will be on hand.

# Editors' Book Table

## BOOK REVIEWS

**"Strategic Materials in Hemisphere Defense."** M. S. Hessel, W. J. Murphy, and F. A. Hessel. Published by Hastings House, 67 W. 44th St., New York, N. Y. 1942. Cloth, 8¼ by 5½ inches, 235 pages. Bibliography. Price $2.50.

The sources, potential sources, needs and uses, of 14 strategic and 15 critical materials from the Army's list for hemisphere defense are surveyed in this study of the supply of essential things. Placed at the head of the list are rubber and tin, which the authors call "pearls of great price lost in the Far East." The facts and the figures concerning rubber are those that have been stated and often reiterated in the press during the last ten months, and similar conclusions are also drawn. South and Central American sources of supply of many of our essential needs are briefly discussed. The growth of the American chemical industry and its current rapid expansion, and the importation and synthesis of fats, oils, and gums are surveyed in relation to the war program.

From the correlation of facts and figures presented it is obvious that the tremendous natural wealth of the United States is insufficient to win the war without tapping new sources of supply. After the victory is won, the authors conclude, hemisphere autonomy developed by the emergency will have a large influence on United States prosperity and on world-wide trade and international economy since we will no longer be wholly dependent on sources outside the Western Hemisphere for many raw materials.

**"Patents and Industrial Progress."** George E. Folk. Published by Harpers & Brothers, 49 E. 33rd St., New York, N. Y. 1942. Cloth, 8½ by 5¾ inches, 393 pages. Price $3.

Patent cases presented to the Temporary National Economic Committee by the Departments of Justice and Commerce are summarized, analyzed, and evaluated, and legislative recommendations of the Committee based on governmental department proposals are presented in this study of timely interest to inventors and manufacturers. Charges against the patent system and alleged abuses of patent rights are clearly stated as well as authoritative testimony showing the value of the system under which an industrial progress, unequalled in history, has been achieved in the United States. Cases cited include one in which Charles Goodyear was involved in 1869, and others concerning rubber patents.

The author has had over 40 years' experience in patent law.

**"Electrophoresis of Proteins and the Chemistry of Cell Surfaces."** Harold A. Abramson, Laurence S. Moyer, and Manuel H. Gorin. Published by Reinhold Publishing Corp., 330 W. 42nd St., New York, N. Y. 1942. Cloth, 9¼ x 6¼ inches, 341 pages. Price $6.

The isolation of single proteins from complex natural mixtures for intensive study is an important function of electrophoresis experimentation, which also has proved an effective method of investigating the behavior of proteins at surfaces and in solutions. In this volume the results of investigations by both the moving boundary and the microscopic method are correlated, and the data applied to study of the surfaces to blood cells, the skin, bacteria, latex, etc. The theoretical discussion is prefaced by an elementary presentation of the general principles of electrophoretic migration in liquids, and brief chapters on the historical background, and methods. The book is primarily of interest to those workers investigating the surface chemistry of living cells.

The chapter on latex discusses the surface chemistry of latex particles and describes the behavior of the proteins of *Euphorbia* and *asclepias* latices.

**"Labor Arbitration.** Principles and Procedures." John A. Lapp. Published by National Foremen's Institute, Inc., Deep River, Conn. August, 1942. Cloth, 5 by 7 inches, 236 pages. Price $3.50.

This comprehensive manual of procedures in arbitration of labor disputes begins with a concise exposition of the whole field of labor arbitration, a description of the various types of labor cases, and the laws pertaining to arbitration. Later chapters discuss in detail and from a practical point of view the mechanics of conducting arbitration. Such vital factors as the organization of an arbitration, preparing the case, and the award are based on the author's experience in arbitrating over 400 cases in the past ten years. An appendix contains examples of arbitration agreements.

**"A.S.T.M. Standards on Textile Materials."** Published annually by the American Society for Testing Materials, 260 S. Broad St., Philadelphia, Pa. October, 1942. Paper 6 by 9 inches, 440 pages. Indexed. Price $2.25. This publication, issued annually under the sponsorship of A.S.T.M. Committee D-13 on Textile Materials, gives in their latest form each of the 73 standards on textile materials as developed through the work of this Society. Of special note is the information given in a 15-page section of photomicrographs of common textile fibers, information on basic properties, yarn number conversion table, table for relative humidity, and an important glossary of terms relating to textile materials, which includes a discussion with illustrations of defects in woven fabrics, and definitions. Of the 73 specifications and tests, 19 cover cotton and cotton goods, nine cover rayon, and 10 cover wool and wool yarn. Other widely used standards cover asbestos, glass, and other miscellaneous materials such as single jute yarn, jute rove and plied yarn (electrical purposes), lime for textile purposes, household blanketing, and electrical insulation (thickness). Sixteen of the standards are general in nature covering testing machines, fibers (identification and determination), fire-retardant properties, evaluating compounds for insect resistance, resistance to water, finishes on textiles (identification), and resistance to microorganisms.

Included is a list of papers on textiles presented before the Society or at meetings of Committee D-13, and there are abstracts of three recent papers involving statistical methods or technique in testing as related to this field.

## NEW PUBLICATIONS

**"Stokes 'Standard' Molding Presses."** F. J. Stokes Machine Co., Olney P. O., Philadelphia, Pa. 16 pages. This new catalog, No. 427, describes in detail features of "Standard" design and construction such as automatic cycle control, triple toggle action, method of controlling speed of final closing, and others that make these presses preferred equipment in many plants for precision molding, insert work, parts with thick and thin sections or having pins or projections liable to damage, as well as for a wide range of general molding work. This booklet should be of interest to plants molding synthetic rubber parts or plastics.

**"Butyl Rubber**—Manufacture of Tires and Inner Tubes." Stanco Distributors, Inc., 26 Broadway, New York, N. Y. 8 pages. This pamphlet gives latest processing details of the use of Butyl rubber for tires and covers stocks for carcass, beads, and treads with representative compound formulae included in the appendix. Information on tire building, construction, bagging, and curing gives the best technique for these operations and mentions that procedures outlined may be conservative and more time-consuming than ordinarily desired, but are given as a sure way to obtain satisfactory results and are open to improvement. A faster rate of production may be realized as more experience and knowledge are gained in handling larger volumes of this rubber. In a similar way the manufacture of inner tubes including tubing, splicing, and the recommendation for attaching the valves with Butyl rubber valve pads is included. A section on quality explains the results of tests on Butyl rubber tires and tubes in relation to the basic properties of this type rubber and present methods of manufacture of these products from it. A review of the precautions necessary in factory processing of Butyl rubber and a short discussion of cured properties are also given.

**"Cabot Carbon Black—Industrial Highlights."** Godfrey L. Cabot, Inc., 77 Franklin Street, Boston, Mass. 16 pages. This booklet, the first in a series of graphical presentations by this company, is designed for distribution to those industries in which carbon black plays an important part. Illustrations and discussion of the manufacture of carbon black in the company's plants together with material on the use of carbon blacks in manufacture of tires are included.

**"Robinson Processing Equipment."** Bulletin No. 300. Robinson Mfg. Co., 30 Church St., New York, N. Y. 6 pages. This illustrated folder presents brief descriptions of a wide variety of latest developments in the company's "Unique" line of machines including gyro-sifters, cutters, grinders, mixers, mills, pulverizers, and crushers.

**"The Activator."** The New Jersey Zinc Co., 160 Front St., New York, N. Y. October, 1942. 12 pages. This pamphlet provides up-to-date information on the availability of the various types of zinc oxide with particular reference to the classification of American process zinc oxide in the WPB list of critical materials under Group III (*materials available in significant quantities as substitutes for scarcer materials*). A listing of "slow-curing" and "fast-curing" grades is included, and a rather complete discussion of physical and chemical properties, processing and vulcanization characteristics, etc., with natural rubber is also brought up-to-date with the most recent information on these subjects. It is indicated that the information provided is generally applicable for use with Buna S compounds and that new and specific information on the use of zinc oxide for these synthetic rubber compounds will be made available as soon as possible.

**"The Royle Forum."** No. 20. John Royle & Sons, Paterson, N. J. 8 pages. A discussion on the use of the extruding equipment used in producing watertight rubber slide fasteners for use on life-saving suits is contained in this issue, along with notes on the "launching" of a new Royle extruder and the assembly of circular looms, production of which has increased with the wartime demand of woven hose for civilian and military needs.

**"Materials of Chemical Construction."** Atlas Mineral Products Co. of Pennsylvania, Merztown, Pa. 16 pages. This booklet provides information on cements, linings, jointing materials, and protective coatings, resistant to acids, alkalies, corrosive salts, various fats and oils, and organic solvents. Rubber and synthetic rubber linings are featured as well as those using synthetic resins.

**"Foreign Commerce and Navigation of the United States for the Calendar Year 1940."** United States Department of Commerce, Bureau of Foreign and Domestic Commerce, Washington, D. C. 1942. 985 pages. Indexed. Price $2.75. For sale by the Superintendent of Documents, Washington. The annual report of the foreign commerce of the United States is comprehensively tabulated and covers imports and exports by articles, countries, and customs districts. Import and export statistics of interest to the rubber industry pertain to rubber and substitutes, cement, compounding agents, manufactures, and seed.

**"Du Pont Accelerators Suitable for All-Reclaimed Rubber Stocks."** B1-49. E. I. du Pont de Nemours & Co., Inc., Wilmington, Del. 30 pages. Because of the increased use of all-reclaim compounds, this study has been made to show the comparison of the accelerators which are finding the widest application in these compositions. Discussions of the recommended accelerators cover the thiuram, benzothiazole, aldehydeamine, and guanidine types. Four comprehensive tables contain data on the physical properties of the various all-reclaim stocks when loaded with whiting, clay, channel black—with and without mineral rubber, in the presence of suitable accelerators.

**"Taylor Aneroid Manometer for Flow and Liquid Level."** Bulletin 98160. Taylor Instrument Cos., Rochester, N. Y. 8 pages. Detailed literature on this new instrument for control of flow and liquid level in processes involved in the manufacture of butadiene, styrene, high-octane gasoline, alcohol, acids, etc., is given.

**"Thermodynamic Study of the Elastic Extension of Rubber."** L. R. G. Treloar. Publication No. 24. British Rubber Producers' Research Association, 19 Fenchurch St., London, E. C. 3, England. 8 pages. In this study it is shown how the internal energy and entrophy changes taking place when rubber is stretched may be determined either by a study of the variation of tension with temperature or by measurement of the heat involved. Though quantitative accuracy is not found, the evidence substantiates the kinetic-statistical explanation of rubber elasticity. Crystallization, though giving rise to important thermal effects, is not essentially connected with the phenomenon of elasticity.

**"A Summary of Data on Reclaimed and Scrap Rubber."** The Rubber Manufacturers Association, Inc., 444 Madison Ave., N. Y. 20 pages. This bulletin, designed primarily for writers on the subject of rubber, is a digest of information on scrap and reclaimed rubber that has appeared in various publications. A list of sources for additional data is given. The bulletin represents a very useful source of information on these subjects as regards processes, historical background, statistics, and current events up to August, 1942.

**"American Standards."** American Standards Association, 29 W. 39th St., New York, N. Y. 20 pages. Over 550 standards are in this new price list, with separate headings for American Safety Standards and American War Standards which have been developed in recent months specifically for war production needs. As government orders are based on specifications, engineering and purchasing departments of manufacturing firms will find this particular list a useful reference piece in simplifying production problems by the use of standards.

**"Rubber-Tired Equipment of Principal Farm Machines."** A. P. Brodell and R. A. Pike. Bureau of Agricultural Economics and Agricultural Marketing Service, United States Department of Agriculture, Washington, D. C. 1942. 10 pages. Information collected by 25,000 crop correspondents in 1941 on the use of rubber tires on tractors and some other farm machines is summarized in this report. Data on the age and type, geographical location, and extent of use of rubber tires for more than 13,000 tractors are given in tables.

**"The Storage Battery Manufacturing Industry.** 1942 Year Book." The Association of American Battery Manufacturers, Akron, O. 40 pages. Price 25¢. Storage battery manufacturers interested in a statistical picture of the industry will find sufficient data in this booklet which includes statistics on total battery production, number and value of exports, replacements, car registration, and raw materials. An historical sketch of the Association and its responsibility to the government and its members during wartime are briefly outlined.

**"*Kok-Sagyz*, Family *Compositae*, as a Practical Source of Natural Rubber for the United States."** Paul J. Kolachov. National Farm Chemurgic Council, 50 W. Broad St., Columbus, O. 20 pages. Price 25¢. This pamphlet contains a good survey of the history, cultivation, and economic aspects of the possible use of *kok-sagyz* as a source of natural rubber for the United States. The material for this article was obtained from recent literature on this subject from Russia, and the author strongly recommends active research on the cultivation of this plant.

**"Vinylite Resins.** Their Forms, Properties, and Uses." Carbide & Carbon Chemicals Corp., 30 E. 42nd St., New York, N. Y. 20 pages. The purpose of this booklet is to acquaint industry's executive and technical men with the wide range of useful properties of the Vinylite resins and the forms in which they are produced. Under copolymer resins, in addition to a table of general resistance properties, are descriptions of the use of these resins for surface coatings, as rigid sheets, and as plasticized sheeting and film. Molding and extrusion compounds are divided into two classes, rigid compounds and elastomeric compounds, and a table shows applications of both of these types for specific purposes. Sections on special Vinylite copolymer products, Vinylite polyvinyl butyral, polyvinyl acetate, and polyvinyl chloride resins conclude the booklet.

**"Tygon.** At Home in the World of Corrosion." The United States Stoneware Co., Akron, O. 16 pages. This booklet describes the physical characteristics and specific applications of Tygons, which are classified as a series of modified halide polymers, new condensation resins, and diene derivatives compounded to various formulae to produce materials with a wide range of physical properties. The use of Tygons for tank lining, pipe coatings, gaskets, and coating of various metal objects is illustrated, and the use of the materials for electric insulation and tubing is also covered. Fabric impregnation with Tygons, which offers a multitude of possible applications, is also illustrated.

**"Extraction of Rubber from Plants."** Muriel E. Whalley, National Research Council of Canada, Ottawa, Ont., Canada. 19 pages. Price 25¢. This report resulted from a search of the literature on this subject in the American Chemical Abstracts and numerous other books, pamphlets, etc. It is divided into three sections: (1) in which original articles are reviewed in detail, (2) in which references are listed, and (3) in which other material of which complete articles were not readily available is presented in the form of abstracts.

**"Rubber from Guayule."** United States Department of Agriculture, Forest Service, Washington, D. C., September 1, 1942. 7 pages. **"How to Keep Rubber in Active Service."** Dunlop Tire & Rubber Goods Co., Ltd., Toronto, Ont., Canada. 34 pages. **"Wartime Strikes in American Industry."** National Association of Manufacturers, 14 W. 49th St., New York, N. Y. 16 pages. **"Peace Aims and Post-War Planning."** F. M. Brodie, World Peace Foundation, 40 Mt. Vernon St., Boston, Mass. 56 pages. **"The United States and the Far East: Certain Fundamentals of Policy."** S. K. Hornbeck, World Peace Foundation. 108 pages. **"A Table of Common Hazardous Chemicals."** National Fire Protection Association, 60 Batterymarch St., Boston, Mass. 32 pages. **"Repairing, Splicing Simplex Tirex-Multiple Conductor Rubber Jacketed Cables."** November, 1942. Simplex Wire & Cable Co., Cambridge, Mass. 4 pages. **"Repairing, Splicing Simplex Tirex-Single Conductor Rubber Jacketed Cables."** Oct., 1942. Simplex Wire & Cable Co. 4 pages. **"Classified Directory."** Seventh revised edition. Association of Consulting Chemists & Chemical Engineers, Inc., 50 E. 41st St., New York, N. Y. 72 pages. **"Plastics from Agricultural Materials."** O. R. Sweeney and L. K. Arnold. The Iowa State College Bulletin, Ames, Iowa. 52 pages. **"The Sunlight Resistance of Neoprene-Rubber Blends."** B1-47. E. I. du Pont de Nemours & Co., Inc., Wilmington, Del. 4 pages. **"Drug Sundries and Surgical Articles Made from Neoprene Type Gn."** B1-46. E. I. du Pont de Nemours & Co. 4 pages.

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Storage and Containers for 1, 3-Butadiene. *Chem. Met. Eng.*, Nov., 1942, pp. 117-19.

Current Importance of Synthetic Latices and a Review of One of Them (Neoprene Latex Type 571). H. H. Abernathy, *Rubber Age* (*N. Y.*), Nov. 1942, pp. 125-27, 132.

How the Production of Air-Foam Rubber Is Controlled At the Goodyear Factory. H. C. Jenks and J. Grotzinger, *Rubber Age* (*N. Y.*), Nov., 1942, pp. 128-32.

Vulcanization or Other Heat Treatment by Electrical Conduction. F. L. Yerzley, *Rubber Age* (*N. Y.*), Nov., 1942, pp. 133-34.

Better Management for the Rubber Factory. IV. A Roberts, *Rubber Age* (*N. Y.*), Nov., 1942, pp. 135-37.

Abstracts of United States Patents on the Compounding and Use of Synthetic Rubber. V. F. Marchionna, *Rubber Age* (*N. Y.*), Nov., 1942, pp. 138-41.

# Patents and Trade Marks

## APPLICATION

### United States

2,297,727. **Toy Deepsea Diver.** P. V. Svoboda and A. I. Drasin, both of New York, N. Y.

2,297,874. **Rubber Protective Helmet.** J. T. Clark, Cicero, Ill., assignor to John T. Clark Co., a corporation of Ill.

2,297,951. **Airplane Deicer.** N. Frank, Newark, assignor of 24½% to L. J. Goldberg, Orange, and 24½% to W. G. Winne, Hackensack, all in N. J.

2,297,994. **Douche.** J. Vellinga, Chicago, Ill.

2,298,007. **Hydraulic Actuator with Resilient Sealing Element.** R. A. Goepfrich assignor to Bendix Aviation Corp., both of South Bend, Ind.

2,298,008. **Brake Having a Pair of Resilient Sealing Elements in Compression between the Piston Heads and the Cylinder End Plugs.** R. A. Goepfrich, assignor to Bendix Aviation Corp., both of South Bend, Ind.

2,298,033. **Non-Skid Tire Tread.** A. C. Bowers, Akron, O., and C. M. Du Puy, Grensburg, Pa., assignors to Pennsylvania Rubber Co., Jeannette, Pa.

2,298,119. **Connector Device with Resilient Gasket Element.** S. C. Gebert, Three Rivers, Mich., assignor to Fairbanks, Morse & Co., Chicago, Ill.

2,298,141. **Terminal Device for Electrical Apparatus, Having an Insulating Sleeve on the Terminal Stud.** R. E. Marbury, Wilkinsburg, assignor to Westinghouse Electric & Mfg. Co., East Pittsburgh, both in Pa.

2,298,142. **Elastic Spoke Tire.** J. V. Martin, Milton, N. Y.

2,298,226. **Resilient Rug Pad of Insulating Material Having Grooves Extending Longitudinally and Transversely of the Pad, the Grooves Being of a Size to Accommodate Electrical Conductive Means.** J. J. O'Brien and J. Strad, both of Chicago, Ill.

2,298,338. **Replacement Washer for Water Faucets.** E. A. Berkery, Marlboro, N. Y.

2,298,361. **Ice or Hot Water Breast Bag.** E. A. Freund, New York, N. Y.

2,298,402. **Pump and Compressor with Elastic Sleeve Elements.** J. Mercier, Paris, France.

2,298,411. **Electrolytic Cell with a Flexible Liquid Tight Gasket Having Sleeve Portions Encircling Part of the Terminals.** H. Waterman, Collingswood, N. J., assignor to Aerovox Corp., New Bedford, Mass.

2,298,445. **Threshing Cylinder Attachment with a Rubber Part Providing a Beating Surface.** A. B. Welty, Moline, Ill., assignor to International Harvester Co., a corporation of N. J.

2,298,463. **Bearing Seal with Annular Seal Ring of Resilient Rubber-Like Material.** W. G. Burt, Jr., assignor to Fafnir Bearing Co., both of New Britain, Conn.

2,298,579. **Concrete Mold Lining Comprising a Layer of Absorbent Sheet Material, a Facing Layer of Material Non-Adhesive to Cement Secured to the First Sheet by a Layer of Permeable, Water-Insoluble Adhesive, and a Backing Sheet of Fibrous Sheet Material Adhered to the Absorbent Layer by a Layer of Adhesive Adapted to Be Loosened by the Action of Water Derived from the Concrete.** A. W. Meyer, Nutley, N. J., assignor to United States Rubber Co., New York, N. Y.

2,298,584. **Packing Ring, Cup Washer, Etc., of Resilient Rubber.** J. H. Onions, London, England.

2,298,627. **Sewage Tank Sampler with Yieldable Valve Parts.** C. F. Proudman and H. H. Goossen, both of New Canaan, Conn.; Goossen assignor to Proudman.

2,298,708. **Roll Top Stocking with Top Knit of Elastic Yarn.** E. C. Lochhead, Moberly, Mo.

2,298,736. **Flanged End Hose Having a Rubber and Fabric Body.** D. E. Harpter, Akron, O., assignor to Wingfoot Corp., Wilmington, Del.

2,298,737. **Foundation Garment.** E. D. Kattermann, Dover, and E. P. Acriggins, East Orange, assignors to Swiss Knitting Co., Dover, both in N. J.

2,298,738. **Flanged Hose Having a Tubular Body Portion of Rubberized Fabric.** E. G. Kimmich and J. L. Cutler, both of Akron, O., assignors to Wingfoot Corp., Wilmington, Del.

2,298,811. **Fish Lure with Fibrous Upper Body Section and Sponge Rubber Lower Section.** A. Sisco, Kokomo, Ind.

2,298,841. **Increasing the Strength and Durability of Sheer Knitted Silk Fabric by Immersing It into a Dilute Solution of Solid Polybutene Polymers.** R. L. Pyner, Roselle, and H. C. Paulsen, Elizabeth, both in N. J., assignors by mesne assignments, to Jasco, Inc., a corporation of La.

2,298,941. **Elasticized Shoe Construction and Shoe Gore therefor.** G. M. Herrmann, Ridgewood, N. J.

2,298,986. **Cushioning Material of Spongelike or Cellular Rubber.** S. D. Taylor and E. W. Madge, both of Sutton Coldfield, and E. A. Murphy, Wilde Green, assignors to Dunlop Rubber Co., Ltd., London County, all in England.

2,299,009. **Cushioned Rubber Heel Containing Cone Springs.** A. J. Denk, Delphi Ind.

2,299,035. **Removable Waterproof Jacket for a Flashlight.** H. Rothenberg, Norwood, N. J., and L. C. Grimsley, Jackson Heights, assignors to H. Hyman, Brooklyn, both in N. Y.

2,299,078. **Insulating, Waterproof, and Buoyant Tent with an Inner Sheet of Material Comprising Expanded Cellular Rubber.** E. C. Craig, United States Navy, and G. W. Leyde, Arlington, Va.

2,299,162. **Electrically Heated Sinus Pad, with Conductive Rubber Face Portions.** L. Marick, Grosse Pointe Farms, Mich., assignor to United States Rubber Co., New York, N. Y.

2,299,171. **Rotary Hose Coupling.** J. A. Muller, Paterson, N. J., assignor to United States Rubber Co., New York, N. Y.

2,299,172. **Rotary Hose Coupling Assembly.** J. A. Muller, Ridgewood, N. J., assignor to United States Rubber Co., New York, N. Y.

2,299,193. **Conduit Coupling with Rubber Sealing Ring.** W. C. Trautman, Los Angeles, Calif., assignor to Bendix Aviation Corp., South Bend, Ind.

2,299,219. **Dual-Chambered Inner Tube.** L. B. Foley, Alamosa, Colo.

2,299,243. **Tire with Three Independent Tube Sections Mounted within the Casing, Extending Two-thirds of the Circumference of the Casing and Overlapping Each Other about One-half the Length of the Sections.** E. R. Mayer, Sr., Amarillo, Tex.

2,299,305. **Platform Shoe with Resilient Pad in the Forward Portion of the Sole.** F. Ciaio, Corona, Long Island, N. Y.

2,299,356. **Utility Crossover Comprising a Pad of Elastic Material.** W. T. Strohm and R. S. Comer, both of West Los Angeles, Calif., assignors to Twentieth Century-Fox Film Corp., Los Angeles, both in Calif.

2,299,365. **Meter Changing Water Cutoff Utilizing an Expansible Resilient Plug.** S. Valuch, Cudahy, Wis.

2,299,395. **Shaft Seal with Resilient Sealing Element.** A. E. Karlberg, assignor to Chicago Seal Co., both of Chicago, Ill.

2,299,482. **Electric Shaver with Rubber Bumper Elements.** R. Knoop, assignor to Knapp-Monarch Co., both of St. Louis, Mo.

2,299,595. **Window Guide with Soft Cushioning Material in Contact with the Window.** A. Rydquist, assignor to Schlegel Mfg. Co., both of Rochester, N. Y.

2,299,661. **Flexible Support for Vibrated Members with Rubber Tilting Compression Block.** L. G. Symons, Hollywood, Calif., assignor to Nordberg Mfg. Co., Milwaukee, Wis.

2,299,710. **One-Piece Syringe Nozzle.** W. F. Dray, Providence, R. I., assignor to Davol Rubber Co., a corporation of R. I.

2,299,726. **Brake Arrangement with Spaced Resilient Pads Supporting a Ring Cylinder.** W. H. Baselt and W. A. Helsten, assignors to American Steel Foundries, all of Chicago, Ill.

2,299,760. **Pump, Syringe, and Like Appliances for Surgical and Medical, Etc., Purposes.** H. H. Schulz, Wembley, England.

2,299,805. **Highly Compressed Laminated Flexible Packing Structure Comprising Layers of Flexible, Compressible Paper and Resilient, Compressible Adhesive Material.** H. B. Denman, assignor to Detroit Gasket & Mfg. Co., both of Detroit, Mich.

2,299,855. **Static Ring for Lineman's Rubber Glove.** E. S. Smith, Ravenna, O.

2,299,903. **Corset.** M. Kahn, Cedarhurst, assignor to Artistic Foundations, Inc., New York, both in N. Y.

2,299,978. **Well Casing Protector Comprising an Annular Rubber Ring Adapted to Be Stretched and Contracted upon the Drill Pipe.** J. E. Hall, Bakersfield, Calif., assignor to Gustin Bacon Mfg. Co., Kansas City, Mo.

2,300,013. **Yielding Torsion Joint with Flexible Rubber Bushings.** F. W. Sampson, Dayton, O., assignor to General Motors Corp., Detroit, Mich.

2,300,072. **Electrical Condenser Comprising a Pair of Metal Foil Plates and a Dielectric Interposed between Comprising a Film of Regenerated Cellulose and a Film of Polyisobutylene.** W. H. Smyers, Westfield, N. J., assignor, by mesne assignments, to Jasco, Inc., a corporation of La.

2,300,084. **Combination Baseboard and Floor Covering.** C. Wright, assignor, by direct and mesne assignments, of one-half to Wright Rubber Products Co., both of Racine, Wis., and one-half to P. L. Cassidy, Chicago, Ill.

2,300,091. **Pad to Convert an Ordinary Shoe into a Bowling Shoe.** W. D. Barry, Washington, Pa.

2,300,111. **Faucet and Deformable Ball Valve therefor.** J. L. Edlund, Calgary, Alta., Canada.

2,300,135. **Flexible Joint for Flour Sifters.** H. B. Rice, assignor to Mission Rubber Co., both of Houston, Tex.

2,300,153. **Girdle.** H. M. Herbener, Thomasville, Ga.

2,300,155. **Reenforced Fabric Material for Wearing Apparel Having a Discontinuous Layer of Rubber Composition.** S. Heintz, Newtonville, Mass., assignor, by mesne assignments, B. F. Goodrich Co., Akron, O.

2,300,241. **Covered Rubber Thread Comprising a Rubber Core, a Cover Enclosing It, and a Nylon Thread Extending along the Core and Enclosed in the Cover whereby It Serves to Limit the Extent of Stretch of the Rubber Thread without Breaking under a Sharp Snap.** G. S. Van Voorhis, assignor to United Elastic Corp., both of Easthampton, Mass.

2,300,335. **Pitman including an Elongated Body Member Formed of Rubber.** F. T. Bonebrake, assignor of one-quarter to C. H. Martin, and one-quarter to F. P. Martin, all of Topeka, Kans.

### Dominion of Canada

407,612. **Device to Produce a Rolled Hairdress, Including a Colored Elongated Sponge Rubber Body.** E. C. Thompson and R. M. McFadden, co-inventors, both of Los Angeles, Calif., U. S. A.

407,684. **Ball and Socket Joint with Flexible Rubber Element in Sealing Engagement with the Housing and Stud Member for Confining Lubricant in the Joint.** Columbus Auto Parts Co., assignee of W. A. Flumerfelt, both of Columbus, O., U. S. A.

407,717. **Rubber Protector for Drill Pipes.** Patterson-Ballagh Corp., assignee of J. C. Ballagh, both of Los Angeles, Calif., U. S. A.

407,743. **Locking Snap Fastener with a Covering of Latex Rubber.** United-Carr Fastener Corp., Cambridge, Mass., assignee of C. L. Hall, Detroit, Mich., both in the U. S. A.

407,754. **Rail Truck Frame with Rubber Elements Supporting the Journal Bearings from the Girder Ends in Shear.** Transit Research Corp., assignee of E. H. Piron, both of New York, N. Y., U. S. A.

407,756. **Stocking with Elastic Yarn Area.** S. I. and M. M. Burd, co-inventors, both of Philadelphia, Pa., U. S. A.

407,798. **Railway-Car Truck Support with Rubber Mountings Comprising Flat Panels Disposed at an Angle to the Direction of Normal Load.** E. G. Budd Mfg. Co., assignee of J. Ledwinka, both of Philadelphia, Pa., U. S. A.

407,800. **High-Tension Electric Cable Having a Wall of Vulcanized Rubber Compound and One or More Wrappings of Rubberized Cloth Tape.** Canada Wire & Cable Co., Ltd., Leaside, Ont., assignee of General Cable Corp., New York, N. Y., assignee of R. W. Atkinson, Perth Amboy, N. J., both in the U. S. A.

407,857. **Hose Connection with Yieldable Gasket.** Flex-O-Tube Co., assignee of N. M. Coury, both of Detroit, Mich., U. S. A.

407,901. **Railway Vehicle Truck with Pairs of Rubber Journal Springs.** Transit Research Corp., assignee of E. H. Piron, both of New York, N. Y., U. S. A.

407,935. **Inflatable Skirt Attachment for Sportsmen's High Waders.** C. L. Stokes, Los Angeles, Calif., U. S. A.

407,984. **Business Machine with Vibration-Absorbing Resilient Pad Members.** Felt & Tarrant Mfg. Co., assignee of H. A. Leedy, both of Chicago, Ill., U. S. A.

407,985. **Frictional Torque Transmitting Device with Releasable Drum Engaging Element Having an Expansible Inflatable Rubber Annulus Mounted in a Circumferential Channel.** General Tire & Rubber Co., assignee of H. T. Kraft, both of Akron, O., U. S. A.

407,991. **Catheter.** Lee Rubber & Tire Corp., assignee of R. J. Limbert, both of Conshohocken, Pa., U. S. A.

407,994. **Clothes Wringer with Reversing Device Having a Wringer Roll-Engaging Tube of Resilient Material.** Lovell Mfg. Co., assignee of W. L. Kauffman, II, both of Erie, Pa., U. S. A.

408,022. **Container Closure Liner Comprising Rubber Chloride and Polymerized Vinyl Acetate.** Raolin Corp., New York, N. Y., assignee of J. W. Raynolds, Pittsburgh, Pa., both in the U. S. A.

408,024. **Box-Shaped Rubber Lined Fluid Controlling Valve System.** Saunders Valve Co., Ltd., Cwmbran, assignee of A. W. Jones, Newport, both in Monmouthshire, England.

408,114. **Flexible Metal Tubing with a Rubber Strand Incorporated therein.** Fidelity Machine Co., Wilmington, Del., assignee of W. Larkin, Norristown, Pa., both in the U. S. A.

408,116. **Gas Mask.** Guy R. Fountain, Ltd., assignee of A. E. C. Snell and H. J. Houlgate, all of London, England.

408,119. **High Overshoe.** B. F. Goodrich Co.,

New York, N. Y., assignee of L. H. L'Hollier, Waltham, Mass., both in the U. S. A.

### United Kingdom

547,375. **Flexible Couplings for Pipes, Etc.** Metalastick, Ltd., A. G. Barrett, and M. Goldschmidt.

547,448. **Collapsible Boats.** Wingfoot Corp.

547,461. **Electric Cables.** W. T. Henley's Telegraph Works Co., Ltd., and W. W. Watkins.

547,514. **Puncture-Sealing Inner Tubes.** United States Rubber Co.

547,617. **Joints or Terminating Devices for Electric Cables.** Pirelli-General Cable Works, Ltd., and H. Barron.

547,648. **Hair Comb.** United States Rubber Co.

547,842. **Electrically Heated Wearing Apparel.** United States Rubber Co.

548,149. **Flexible Couplings and Machine Mountings.** T. B. Andre Rubber Co., Ltd., and R. D. French.

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# PROCESS

### United States

2,297,787. **Process of Imparting Transparency to Articles Formed from Clear Rubber Stock by Applying a Coating of Transparent Rubber Cement to Provide a Smooth New Surface, and Vulcanizing the Coating.** P. A. Locke, assignor to Oak Rubber Co., both of Ravenna, O.

2,298,101. **Rubber Nasal Masks.** C. L. Beal, Cuyahoga Falls, assignor to American Anode, Inc., Akron, both in O.

2,298,867. **Cut-Toothed Power Transmission Belts.** R. Y. Case, assignor to L. H. Gilmer Co., both of Philadelphia, Pa.

2,299,593. **Making Closed Cell Expanded Rubber by Internally Developed Gases.** D. Roberts, New York, R. C. Bascom, Merrick, both in N. Y. and L. Cooper, Monson, Mass., assignors to Rubatex Products Inc., New York, N. Y.

2,299,955. **Weather Strip Having a Preformed Rubber Cover in an Unstressed Condition and Completely Enclosing the Bead and Attaching Strip.** L. Spraragen, assignor to Bridgeport Fabrics, Inc., both of Bridgeport, Conn.

2,299,988. **Method of Forming a Bundle of Rubber Adapted for Producing Rubber Derivatives by Exothermal Reaction with Fluid Reagents.** H. F. Irving, assignor to Marbon Corp., both of Gary, Ind.

2,300,062. **Covering a Ball with a Pile Fabric.** G. S. Radford, Norwalk, assignor to A. G. Spalding & Bros., Inc., Chicopee, Mass.

### Dominion of Canada

407,747. **Wrapping an Article with a Thermo-Stretchable, Thermo-elastic, and Heat-Sealable Sheet.** Wingfoot Corp., Wilmington, Del., assignee of J. E. Snyder, Akron, O., both in the U. S. A.

407,895. **Production of Improved Cellulosic Textile Material Adapted to Adhere to Rubber, Which Comprises Pre-Treating Textile Yarns with a Cationic Soap, Coating it with an Aqueous Dispersion of Rubber, Coagulating the Dispersion, and Drying the Coated Material.** H. Dreytus, London, assignee of D. Finlayson, R. G. Perry, and W. J. Simpson, co-inventors, all of Spondon, both in England.

407,899. **Making Extension Members by Vulcanizing an Elongated Resilient Body in Helical Form upon a Mandrel, Arranging a Conductor Member in the Body, Braiding a Cover over the Conductor, and Reversing the Pitch of the Loops.** J. W. Campbell, Los Angeles, Calif., U. S. A.

407,934. **Producing Sponge Rubber Products by Passing an Alternating Electric Current through the Foam to Form Sufficient Heat in the Walls of the Bubbles to Cause at Least Partial Curing of the Rubber in Situ.** W. E. Stewart, Towanda, Pa., U. S. A.

408,002. **Method Forming a Relief Design in a Fabric Which Comprises Assembling the Fabric with an Elongated Removable Riser and a Reenforcing Sheeting, Vulcanizing the Fabric and Sheeting together along the Sides of the Riser by Means of Rubber, Withdrawing the Riser, and Substituting a Permanent Fibrous Riser.** National Automotive Fibers, Inc., assignee of G. R. Cunnington, both of Detroit, Mich., U. S. A.

408,172. **Tire Casing Treading.** P. E. Hawkinson, Minneapolis, Minn., assignee of A. D. Owen, San Francisco, Calif., both in the U. S. A.

### United Kingdom

547,561. **Rubber-Coated Metal.** H. W. K. Jennings, Honorary Advisory Council for Scientific & Industrial Research.

547,738. **Balloons.** Dunlop Rubber Co., Ltd., J. C. Partridge, J. Rogerson, and F. W. Warren.

547,809. **Microporous Rubber, Etc.** Expanded Rubber Co., Ltd., and A. Cooper.

# CHEMICAL

### United States

22,210. (Reissue.) **Improvement in the Process of Polymerizing Tertiary Base Olefins of Less Than Nine Carbon Atoms by Treating Them with an Active Fluoride to Produce Rubber-Like Polymers.** M. De Simo, Piedmont, and F. B. Hilmer, Berkeley, assignors to Shell Development Co., San Francisco, all in Calif.

2,297,722, 2,297,723. **Polymerizing a Light Oil Fraction Having as a Principal Constituent an Aromatic Olefin Containing the Styrene Structure as a Nucleus.** F. J. Soday, Upper Darby, Pa., assignor to United Gas Improvement Co., a corporation of Pa.

2,297,724. **Treating Styrene-Type Compounds by Polymerizing the Light Oil Fraction by Means of Heat in a Container Having Its Surfaces in Contact with the Fraction of Nickel and Free from Copper and Iron.** F. J. Soday, Upper Darby, Pa., assignor to United Gas Improvement Co., a corporation of Pa.

2,297,871. **Rubber Cements Having Incorporated therein a Halogenated Nitroparaffin Selected from the Chloro- and Bromo-Nitroparaffins Having not more than Eight Carbon Atoms, in an Amount Sufficient to Retard the Vulcanized Gelling of the Cement on Standing.** A. W. Campbell, assignor to Commercial Solvents Corp., both of Terre Haute, Ind.

2,298,078. **Plastic Masses Similar to Factice and Linoxyn Comprising Interpolymerization Products of at Least a Vinyl Ether Having a Plurality of Vinyl Groups in the Molecule and of Esters of Saturated Alcohols with Tall Oil.** W. Wolff, Ludwigshafen-on-the-Rhine, Germany, assignor, by mesne assignments, to General Aniline & Film Corp., New York, N. Y.

2,298,713. **Preparing a Non-Coherent Rubber Powder by Adding to Caustic-Preserved Natural Latex, in the Absence of Added Hydrophilic Colloids and Added Inorganic Materials Which React with the Flocculating Agent, a Quantity of an Aluminum Salt Sufficient to Render the Latex Acid, and Reducing the Flocculated Rubber to a Dry, Free-Flowing Non-Coherent Rubber Powder.** J. A. Merrill, Akron, O., assignor to Wingfoot Corp., Wilmington, Del.

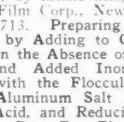
2,298,726. **Rubber Age Resister Comprising the Product Obtained by Reacting an Aryl Amide with a Ketone at a Temperature of about 150-300° C. and with Water Eliminated.** W. Scott, Akron, O., assignor to Wingfoot Corp., Wilmington, Del.

2,298,739. **Alpha Haloacrylonitriles.** J. G. Lichty, Stow, and J. D. D'Ianni, Akron, assignors to Wingfoot Corp., Akron, all in O.

2,298,813. **Processing of High Molecular Weight Plastic Iso-Olefinic Polymers.** L. B. Turner, Roselle Park, N. J., assignor to Jasco, Inc., a corporation of La.

2,298,846. **Process of Homogeneously Blending a Wax with a Linear High Molecular Weight Hydrocarbon Polymer Susceptible to Depolymerization and Breakdown by Heat and Mechanical Attrition.** A. C. Skooglund, Clark Township, N. J., assignor, by mesne assignments to Jasco, Inc., a corporation of La.

2,298,881. **Antioxidant Having the Structural Formula**



**Wherein *R* Represents an Organic Radical with the Free Valence on a Carbon Atom, *R'* Represents a Radical with the Free Valence on a Benzenoid Ring, the *R'* Radical Containing an Aromatic Nucleus of the Benzene, Naphthalene, or Biphenyl Series, and the Two Hydroxy Groups Are in the Para Position on a Benzenoid Ring.** C. F. Biggs, Silver Lake, O., assignor to B. F. Goodrich Co., New York, N. Y.

2,299,139. **Rubber-to-Metal High Viscosity Lubricant Comprising an Ethanolamine Soap in Admixture with Enough Starch Present to Form a Substantially Non-Flowing Aqueous Solution with the Soap.** C. M. Grafton, Grosse Pointe, Mich., assignor to United States Rubber Co., New York, N. Y.

2,299,433. **Finishing Varnish for Application to Decorated Metal Sheet Comprising (1) a Copolymer of a Vinyl Halide and a Vinyl Ester of a Lower Aliphatic Monocarboxylic Acid, and (2) a Copolymer of a Vinyl Halide, a Vinyl Ester of a Lower Aliphatic Monocarboxylic Acid, and a Substance Selected from the Group Consisting of Maleic Acid, Maleic Anhydride or the Lower Alkyl Esters of Maleic Acid, and (3) a Solvent for the Whole Composition.** F. R. Stoner, Jr., and D. M. Gray, both of Sewickley, assignors to Stoner-Mudge, Inc., Pittsburgh, all in Pa.

2,299,509. **Plastic Composition, Comprising Sulphur Dichlorhydrin Plastic, and a Gum Obtained from a Tree in the Family *Sapotaceae* of the Genus *Mimusops*.** C. Snyder, Yonkers, assignor to Liatex Corp., New York, both in N. Y.

2,299,786. **Impregnating Textile Materials with an Aqueous Dispersion of Rubber Containing Synthetic Urea-Formaldehyde Resin Components and a Catalyst Capable of Liberating Acid Together with an Agent Capable of Preventing Coagulation of the Dispersion by the Acid.** A. E. Battye, J. Tankard, and F. C. Wood, assignors to Tootal Broadhurst Lee Co., Ltd., all of Manchester, England.

2,299,862. **Making Vinyl Esters from Carboxylic Acids Having at Least Three Carbon Atoms by Heating an Excess of Vinyl Acetate with the Carboxylic Acid in the Presence of a Mercury Salt of a Strong Acid, and Distilling the Reaction Mixture to Recover the Vinyl Ester Product.** W. J. Toussaint, South Charleston, and L. G. MacDowell, Jr., Charleston, both in W. Va., assignors to Carbide & Carbon Chemicals Corp., a corporation of N. Y.

2,299,906. **Light-Polarizing Material (Molecularly Oriented Polyvinyl Alcohol) Coated with a Photosensitive Layer.** E. H. Land, Boston, Mass., assignor to Polaroid Corp., Dover, Del.

2,299,938. **Preparation of 2-Mercapto Thiazolines.** B. M. Sturgis, Pitman, N. J., assignor to E. I. du Pont de Nemours & Co., Inc., Wilmington, Del.

2,299,951. **Cheese Package Comprising a Crystalline Petroleum Wax, Rubber Resin Obtained by Condensing Rubber in the Presence of Chlorostannic Acid or a Halide of an Amphoteric Metal, and a High Melting Point Amorphous Petroleum Wax.** J. D. Ingle, assignor to Industrial Patents Corp., both of Chicago, Ill.

2,300,056. **Process of Producing a Butadiene-Styrene Interpolymer Which, upon Subjecting to a Plasticizing Treatment by Oxidizing the Interpolymer at Elevated Temperatures in the Presence of Antioxidants, Yields a Product of Good Plasticity, Which Comprises Polymerizing an Aqueous Emulsion of Butadiene-1,3 and Styrene in an Aqueous Alkaline Medium in the Presence of an Emulsifying Agent Soluble in an Acid Medium as well as in an Alkaline Medium and in the Further Presence of a Water Soluble Salt of a Drying Oil Fatty Acid.** H. Meis, Leverkusen-Wiesdorf, and R. Ludwig, Leverkusen-I. G. Werk, both in Germany, assignors, by mesne assignments, to Jasco, Inc., a corporation of La.

2,300,064. **Mixture of a High Molecular Weight Polymer of an Isolefin and a Polyindene Resin Containing Negligible Amounts of Oxygen, the Mixture Being Characterized by Toughness, Elasticity, Adhesiveness, and Water-White Clearness.** R. Rosen, Elizabeth, and W. J. Sparks, Cranford, both in N. J., assignors to Jasco, Inc., a corporation of La.

2,300,069. **Process for the Polymerization of Olefins to High Molecular Weight Substances.** A. C. Skooglund, Clark Township, N. J., assignor by mesne assignments, to Jasco, Inc., a corporation of La.

2,300,168. **Moisture-Proof Sheet Material Comprising a Normally Non-Moisture-Proof Cellulosic Sheet Coated with Chlorinated Rubber Containing in Excess of 50% of Chlorine and a Non-Waxy Chlorinated Polycyclic Hydrocarbon Adapted to Plasticize the Chlorinated Rubber and Render It More Moistureproof.** A. R. Olsen, assignor to Hercules Powder Co., both of Wilmington, Del.

2,300,176. **Precipitating Rubber Chloride from a Solution.** J. W. Reynolds, Pittsburgh, Pa., assignor to Raolin Corp., Charleston, W. Va.

2,300,261. **Purifying Rubber Latex by Separating the Latex into Cream and Serum Portions and Washing the Rubber Particles in the Cream Sufficiently so that not more than 2% of the Original Serum of the Latex Remains in the Final Cream, and Recovering in the Final Cream not more than 50% of the Total Solids of the Original Latex.** J. McGavack, Leonia, N. J., assignor to United States Rubber Co., New York, N. Y.

2,300,262. **Latex Containing 0.2% to 0.75% of a Base Consisting of Ammonia, Water-Soluble Organic Derivatives of Ammonia, or Fixed Alkalies, and also Containing 0.002% to 0.2% of a Material Consisting of Nitrated Compounds or Halogen Substituted Nitrated Compounds of Paraffinic Hydrocarbons Having no more than Three Carbon Atoms.** J. McGavack, Leonia, N. J., assignor to United States Rubber Co., New York, N. Y.

2,300,352. **Flexible Cement in Which the Dispersion is Polymerized Chloroprene Dissolved in an Aromatic Solvent, and the Dispersed Phase Comprises Microscopic Droplets of Rubber Dissolved in a Petroleum Distillate Which Is a Non-Solvent of Polymerized Chloroprene.** R. D. Earle, Cohasset, Mass.

2,300,367. **Shot-Shell Closure Seal Comprising a Thin Disk Adhesively Secured to the End Closure by Means of a Phenol Rubber Product Diluted with a Small Amount of Basic Amino Polymer Capable of Being Forced into Coherent Solid Films Substantially Insoluble in Water and 5% Aqueous Ammonia and Soluble in 2% Aqueous Acetic Acid and Organic Solvents.** J. Harmon, Wilmington, Del., assignor to Remington Arms Co., Inc., a corporation of Del.

2,300,368. **Shot-Shell End Closure Sealed with Milled Cyclized Rubber Containing 25% Resinous Reaction Product of Phenol, Formaldehyde, and**

**Methylamine.** J. Harmon, Wilmington, Del., assignor to Remington Arms Co., Inc., a corporation of Del.

2,300,373. **Paper Coated with a Finishing Varnish in Which the Resinous Solids Consist of a Copolymer of Vinyl Halide and a Vinyl Ester of a Lower Aliphatic Monocarboxylic Acid and a Copolymer of a Vinyl Halide, a Vinyl Ester of a Lower Aliphatic Monocarboxylic Acid, and a Substance Consisting of Maleic Acid, Maleic Anhydride or the Lower Alkyl Esters of Maleic Acid.** F. R. Stoner, Jr., and D. M. Grany, both of Sewickley, assignors to Stone-Mudge, Inc., Pittsburgh, both in Pa.

### Dominion of Canada

407,746. **Preparing Methacrylo Nitrile by Passing Cyanoisopropyl Acetate Containing about 1% of Iodine over Copper at 350-450° C.** Wingfoot Corp., Wilmington, Del., assignee of J. G. Lichty, Stow, O., both in the U. S. A.

407,987. **Sponging Rubber by Maintaining Rubber Stock Impregnated with Gas in a Closed Receptacle under a Constant Pressure and at a Temperature Range of from 130° to 160° F., Reducing the Pressure to Zero While Maintaining the Temperature, and Increasing the Temperature to Vulcanize the Rubber after the Gas Has Been Released.** Industrial Process Corp., Dayton, O., assignee of A. J. Cordrey, Chicago, Ill., both in the U. S. A.

547,372. **Age-Resisters.** Wingfoot Corp.

547,493. **Chlorinated Polymeric Materials.** J. W. C. Crawford, A. D. Jones, and Imperial Chemical Industries, Ltd.

547,506. **Continuous Sheet of Porous or Spongy Rubber, Etc.** J. A. Talalay.

547,730. **Segregating and Concentrating Butadiene from Mixtures of Gases.** Standard Oil Development Co.

548,094. **Polyvinyl Halide Compositions.** British Thomson-Houston Co., Ltd.

# MACHINERY

### United States

2,297,954. **Tire Casing Spreader.** T. Gorzelancyk, Near Sumner, Wash.

2,298,325. **Apparatus for Producing Carbon Black.** I. Williams, assignor to J. M. Huber Corp., both of Borger, Tex.

2,298,485. **Tire Mold.** G. H. Johnson, Los Angeles, Calif.

2,298,685. **Tire Debeader.** E. A. Davis, Akron, O., assignor to B. F. Goodrich Co., New York, N. Y.

2,298,729. **Tire Mold.** C. H. Zimmerman, Akron, O., assignor to Wingfoot Corp., Wilmington, Del.

2,299,269. **Apparatus and Method for Making Dipped Rubber Articles.** J. R. Gammeter, Akron, O.

2,299,270. **Device to Test Thin Rubber Articles.** J. R. Gammeter, Akron, O.

2,299,844. **Apparatus and Process for Covering Tennis Balls.** W. E. Humphrey, Jeannette, Pa.

2,300,095. **Machine and Method to Cover Balls.** A. C. Bowers, Greensburg, Pa., assignor to Pennsylvania Rubber Co., a corporation of Pa.

2,300,096. **Ball-Covering Machine.** A. C. Bowers, Greensburg, Pa., assignor to Pennsylvania Rubber Co., a corporation of Pa.

2,300,162. **Hydraulic Press.** J. H. Maude, Verdun, assignor to Dominion Engineering Works, Ltd., Lachine, both in P. Q., Canada.

2,300,242. **Machine for Buffing Elongated Strips Or Sheets of Relatively Soft Yieldable Material.** G. F. Wikle, Detroit, Mich., assignor to United States Rubber Co., New York, N. Y.

### Dominion of Canada

407,956 and 408,077. **Floor Mat Manufacturing Apparatus.** Baldwin Rubber Co., assignee of D. R. Cotterman, both of Pontiac, Mich., U. S. A.

408,108. **Tire Forming Apparatus.** Dunlop Tire & Rubber Goods Co., Ltd., Toronto, Ont., assignee of H. Smith and H. Taylor, co-inventors, both of Birmingham, Warwickshire, England.

408,118. **Footwear Coating Method and Apparatus.** B. F. Goodrich Co., New York, N. Y., assignee of F. F. Olson, Belmont, and H. L. Davies, Walpole, co-inventors, both in Mass., both in the U. S. A.

### United Kingdom

547,695. **Apparatus for Heat Treating Vulcanizable and Other Electric Insulating Materials.** Okonite Co.

547,751. **Apparatus and Method to Make Corrugated Tubes.** United States Rubber Co.

548,102. **Apparatus and Method for Heat-Treatment of Vulcanizable and Other Electric Insulating Materials.** Okonite Co.

# UNCLASSIFIED

### United States

2,298,333. **Valve Stem Locator for Dual-Tire Wheel.** C. S. Ash, Milford, and L. A. Larsen, Detroit, both in Mich.; Larsen assignor to Differential Wheel Corp., New York, N. Y.

2,298,656. **Wheel Balance Tester.** R. D. Smith, Davenport, assignor to Bee Line Mfg. Co., Scott County, both in Iowa.

2,299,068. **Tire Valve Stem Having a Rubber Body Extending from a Rubber Base Flap.** H. Z. Gora, Bridgeport, Conn., assignor to Jenkins Bros., New York, N. Y.

2,299,133. **Slider for Separable Fasteners.** W. R. Epes, Forest Hills, N. Y., assignor to United States Rubber Co., New York, N. Y.

2,299,879. **Tractor Tire Pump.** F. T. Court, assignor to Deere & Co., both of Moline, Ill.

# TRADE MARKS

### United States

397,996. **Potti-Coat.** Children's training pads. I. B. Kleinert Rubber Co., New York, N. Y.

398,049. **Koyalon.** Brassiere forms. United States Rubber Co., New York, N. Y.

398,057. **Butasan.** Accelerators. Monsanto Chemical Co., St. Louis, Mo.

398,058. **Ethasan.** Accelerators. Monsanto Chemical Co., St. Louis, Mo.

398,059. **Methasan.** Accelerators. Monsanto Chemical Co., St. Louis, Mo.

398,060. **Peptizene.** Plasticizers and softeners. Monsanto Chemical Co., St. Louis, Mo.

398,156. **Fiberlastic.** Rubber-impregnated paper and paper-felt flexible sheet. Bird & Son, Inc., East Walpole, Mass.

398,216. **Tri-Ply.** Weatherstrip. Harnly Weatherstrip Co., not Inc., Chicago, Ill.

398,237. **Kleinert's "A Minute To Pin It."** Dress shields. I. B. Kleinert Rubber Co., New York, N. Y.

398,245. Representation of a horizontally situated badge with a suspended ribbon and superimposed thereon, the words: **"Blue Ribbon Daddy."** Men's suspenders, garters, trouser belts. Pioneer Suspender Co., Philadelphia, Pa.

398,258. **Four Aces.** Golf balls. I. D. Malbrough, Jr., Chicago, Ill.

398,267. **Matusalen 969.** Druggists' sundries. N. G. Fuentes, doing business as Prestige Rubber Co., New York, N. Y.

398,277. **Airlite.** Bathing turbans and bibs. I. B. Kleinert Rubber Co., New York, N. Y.

398,289. **Plastender.** Bituminous material for use in compounding rubber. Allied Chemical & Dye Corp., New York, N. Y.

398,293. **Koloc.** Latex compositions used in depositing individual minute rubber particles in fabrics. United States Rubber Co., New York.

398,304. **Roly Poly.** Rubber sheeting. Sears, Roebuck & Co., Chicago, Ill.

398,322. **Bell-Horn Tropical Weight Elastic Hosiery.** Surgical stockings. William H. Horn & Bros., Inc., Philadelphia, Pa.

398,323. Representation of a bull's head with a bell around its neck and the word: **"Ruberol."** Preparation for preserving and renewing automobile tires. Lehman Bros. Corp., Jersey City, N. J.

398,329. **"Designed to Live in."** Corsets, brassieres, girdles, etc. La Resista Corset Co., Bridgeport, Conn.

398,335. Representation of an oval divided in half by a zig-zag line, each section containing a hand and the words: **"Easy On"** and **"Easy Off"**, one in each section; and a border surrounded by the words: **"Satinized New Slip-On Lining."** Household gloves. Pioneer Rubber Co., Willard, O.

## Circular No. 12

(*Continued from page 297*)

The foregoing charges which are for the account of the consumer and not Rubber Reserve Co. are intended to apply to the entire volume of Balata handled for any consumer during a single month, irrespective of the number of individual deliveries made or the number of dealers involved.

It is, of course, optional as to whether or not the services of dealers are employed and Rubber Reserve Co. is prepared to make deliveries direct to purchasers.

| Grade | Price |
|---|---|
| Surinam Sheet | $0.64 |
| Venezuelan Block | .60½ |
| Prime Manaos Block | .58½ |
| Colombian Block | .58½ |
| Panama Block | .58½ |
| Peruvian Prime (Rosada) | .58½ |
| Chicken Wire | .35 |
| Coquirana Washed and Dried (Aniba) | .35 |
| Coquirana Crude (Aniba) | .29½ |
| Peruvian F.A.Q. (White) | .29½ |
| Massaranduba Washed | .26 |
| Massaranduba Crude | .21½ |

November 9, 1942.

# NICARAGUA

With the proper incentives of attractive price and ocean transportation, Nicaragua may develop into another source of balata. It is reliably reported that substantial amounts of this material are obtainable from certain trees locally known as "tuna." When the trees, which abound in certain areas on the East Coast, are tapped, a milky sap exudes which, when boiled, coagulates into a tough rubbery mass said to resemble both rubber and chicle. The quality seems to approach that obtained in Colombia, Brazil, and other South American countries and is useful for making belting, submarine cables, speaking tubes, telephone receivers, etc.

Authorities differ as to the amounts obtainable, but a fair estimate appears to be 20,000 pounds of balata a month, which it is figured should be possible to deliver free on board steamer, Puerto Cabezas, at a price not over 30¢ a pound.

# MEXICO

The Inter-American program for developing the production of rubber in the Americas is said to be advancing favorably. In Mexico it is intended to establish five demonstration plantations in the southern states of Chiapas, Tabasco, and Vera Cruz, the first one to be at Las Palmas, in Chiapas. Each plantation is to average roughly 1,000 acres, and about 750 acres will be planted with high-yielding *Hevea* budgrafts. At first 300 to 400 young trees per acre will be planted, which are to be thinned out later on.

Already more than 1,500,000 *Hevea* seedlings, produced in government nurseries, are reported ready for planting in the demonstration plantations. It is expected that the presence of such plantations in wild rubber areas will also have the effect of stimulating exploitation of the latter.

# Market Reviews

## RUBBER SCRAP

A FAIR volume of scrap is being received by the dealers. Although this volume is less than current consumption, it is considered that together with the stockpile of scrap accumulated during the drive last summer, sufficient scrap is available to meet the demands of the reclaimers until some time next year when another nation-wide drive will again be made. Although Amendment 3 to Revised Price Schedule 87 became effective officially on October 31, it is understood that these increased ceiling prices are not being charged to the reclaimers at present and that sometime before December 15 another revision of these prices will be announced. Ceiling prices prior to and after October 31 are listed below:

### Maximum Prices at Consuming Centers*

| | Before Oct. 31* | After Oct. 31** |
|---|---|---|
| **Inner Tubes†** | ¢ per lb. | ¢ per lb. |
| No. 2 passenger tubes | 7¾ | 7¾ |
| Red passenger tubes | 7½ | 7½ |
| Passenger tubes | 6 | 6 |
| **Tires‡** | $ per Short Ton | $ per Short Ton |
| Mixed passenger tires | 18.00 | 30.00 |
| Beadless passenger tires | 24.00 | 38.00 |
| Solid tires | 34.00 | 34.00 |
| **Peelings†** | | |
| No. 1 passenger peelings | 47.50 | 75.00 |
| No. 2 peelings | 47.50 | 47.50 |
| No. 1 light colored (zinc) carcass | 52.50 | 82.50 |
| **Miscellaneous Items=** | | |
| Air brake hose | 25.00 | 25.00 |
| Miscellaneous hose | 17.00 | 17.00 |
| Rubber boots and shoes | 33.00 | 33.00 |
| Black mechanical scrap§ | 20.00 | 20.00 |
| General household and industrial scrap | 15.00 | 15.00 |

*For a complete list of ceiling prices see August, 1942 issue, pp. 504-506.
**Complete list of ceiling prices will be reported when available.
†All consuming centers except Los Angeles.
‡Akron only.
=All consuming centers.
§Prior to Oct. 31 sp. gr. above 1.1; after Oct. 31, above 1.15.

### Fixed Government Prices

| | Price per Lb. |
|---|---|
| **Balata†** | |
| Prime Manaos Black | $0.68½ |
| Surinam Sheet | .64 |
| **Guayule** | .17½ |
| **Plantation Grades*** | |
| No. 1-X R.S.S. in cases | .22½ |
| No. 1 Thin Latex Crepe | .23⅝ |
| No. 2 Thick Latex Crepe | .23⅜ |
| No. 1 Brown Crepe | .21⅞ |
| No. 2 Brown Crepe | .21⅝ |
| No. 2 Amber | .21⅞ |
| No. 3 Amber | .21⅜ |
| Rolled Brown | .17⅛ |
| **Synthetic Rubber** | |
| Buna S | .50 |
| Neoprene (GN) | .65 |

*For a complete list of government prices see our June, 1942, issue, p. 254.
†For complete list see this issue, p. 297.

## RECLAIMED RUBBER

THE increased demand for reclaimed rubber which made itself evident during October has continued by virtue not only of the requirements for the 25,000,000 practically all-reclaim tires to be made during the next 18 months, but also because of the increased requirements for reclaim for the recapping program. Ample supplies of reclaim are on hand at present, and no immediate increase in production rate is therefore contemplated. If and when an increase in production is required, this can be made if the labor supply is available.

### Ceiling Prices

| | Sp. Grav. | ¢ per lb. |
|---|---|---|
| **Auto Tire** | | |
| Black Select | 1.16-1.18 | 6½/ 6¾ |
| Acid | 1.18-1.22 | 7¼/ 7¾ |
| **Shoe** | | |
| Standard | 1.56-1.60 | 7 / 7¼ |
| **Tubes** | | |
| Black | 1.14-1.26 | 11¾/11½ |
| Gray | 1.15-1.26 | 12½/13¼ |
| Red | 1.15-1.32 | 12 /12¼ |
| **Miscellaneous** | | |
| Mechanical blends | 1.25-1.50 | 4½/ 5½ |
| White | 1.35-1.50 | 13½/14½ |

The above list includes those items or classes only that determine the price bases of all derivative reclaim grades. Every manufacturer produces a variety of special reclaims in each general group separately featuring characteristic properties of quality, workability, and gravity at special prices.

## Rims Approved and Branded by The Tire & Rim Association

| Rim Size | Oct., 1942 |
|---|---|
| 15" & 16" D. C. Passenger | |
| 16x4.50E | 600 |
| 16x5.00F | 1,925 |
| 17" & over D. C. Passenger | |
| 18x2.15R | 1,114 |
| 18x3.62F | 339 |
| Military | |
| 16x4.50CE | 115,931 |
| 16x6.50CS | 48,682 |
| 20x4.50CR | 6,570 |
| 20x6.00CT | 5,407 |
| 20x10.00CW | 1,244 |
| 24x10.00CW | 150 |
| Flat Base Truck | |
| 17x3.75P (5°) | 250 |
| 18x3.75P (5°) | 2,975 |
| 20x4.33R (6°) | 21,467 |
| 15x5.00S (7°) | 10,323 |
| 16x5.00S (7°) | 3,217 |
| 20x5.00S (7°) | 244,063 |
| 24x5.00S (7°) | 1,717 |
| 15x6.00T (8°) | 3,051 |
| 18x6.00T (8°) | 156 |
| 20x6.00T (8°) | 44,751 |
| 22x6.00T (8°) | 12,449 |
| 20x7.33V (9/10°) | 13,767 |
| 22x7.33V (9/10°) | 498 |
| 24x7.33V (9/10°) | 2,060 |
| 20x8.37V (11°) | 1,330 |
| 24x8.37V (11°) | 463 |
| 24x10.00W | 563 |
| Tractor & Implement | |
| 24x8.00T | 1,889 |
| 28x8.00T | 50 |
| Cast | |
| 24x13.00 | 39 |
| 24x15.00 | 111 |
| TOTAL | 547,151 |

### New York Market Rubber Quotations

| | Oct. 28 1941 | Sept. 28 1942 | Oct. 28 1942 |
|---|---|---|---|
| | (Dollars and Cents) | | |
| **Latex** | | | |
| Normal and concentrated (solid content) lb. | .2825/.295 | .2825/.29 | .2825/.29 |
| **Paras†** | | | |
| Upriver fine lb. | .29 | .... | .... |
| Upriver fine lb. | *.32½ | .... | .... |
| Upriver coarse lb. | .16 | .... | .... |
| Upriver coarse lb. | *.22 | .... | .... |
| Islands fine lb. | .29 | .... | .... |
| Islands fine lb. | *.32 | .... | .... |
| Acre, Bolivian fine lb. | .29¼ | .... | .... |
| Acre, Bolivian fine lb. | *.33 | .... | .... |
| Beni, Bolivian fine lb. | .30 | .... | .... |
| Madeira fine lb. | .30 | .... | .... |
| **Caucho†** | | | |
| Upper ball lb. | .16 | .... | .... |
| Upper ball lb. | *.22 | .... | .... |
| Lower ball lb. | .15½ | .... | .... |
| **Pontianak** | | | |
| Pressed block lb. | .22/.30 | ‡ | ‡ |
| **Africans** | | | |
| Rio Nunez lb. | .18 | .225 | .225 |
| Black Kassai lb. | .18 | .225 | .225 |
| Prime Niger flake lb. | .28 | .35 | .35 |
| **Gutta Percha** | | | |
| Gutta Siak lb. | .24 | ‡ | ‡ |
| Gutta Soh lb. | .30 | ‡ | ‡ |
| Red Macassar lb. | 1.35 | 3.00 | 3.00 |

*Washed and dried crepe. Shipments from Brazil.
†These Brazilian rubbers have been taken over by the Rubber Reserve Co., and no prices have as yet been set.
‡None available at present.

## Rubber Trade Association Elects

Rubber Trade Association of New York, Inc., 15 William St., New York, N. Y., on November 12 held its annual meeting at which the following directors were elected for the ensuing year: *Dealers' Group*, A. L. Grant, R. S. Hamilton, F. Lester Kittle, J. Louis, G. LeRoy Scheinler, S. Pike, Jr.; *Brokers' and Agents' Group*, Philip Billhardt, Jacobus F. Frank, and Fred Pusinelli. The directors thereupon elected the following officers: president, Mr. Grant; vice president, Mr. Scheinler; and treasurer, Mr. Frank. B. G. Davy was reappointed secretary-manager.

## *Cryptostegia* for Haiti

The Board of Economic Warfare, Washington, D. C., on October 28 announced the signing of a contract between the Rubber Reserve Co., Washington, D. C., and the Haitian-American Development Corp., Port au Prince, Haiti, for the large-scale development there of the *cryptostegia* plant as a source of rubber. It is reported that the sum of $5,000,000 is involved and that 100,000 Haitian farm workers will be used for the project, which is expected to cover 106,000 acres.

It is planned to negotiate with other Latin American countries for the cultivation of *cryptostegia*.

# WE ARE SERVING UNCLE SAM

Operating under the direct control and supervision of the Rubber Reserve Co. — a Federal agency — in the purchase and handling of scrap rubber, we are loaning our experience and organization to the promotion of the war effort and have ceased to operate on our own account for the period of the emergency.

We are honored in having this opportunity to do our part in helping to overcome the rubber shortage.

*Serving the Trade since 1868*

## THE LOEWENTHAL CO.

188 W. RANDOLPH ST.
CHICAGO, ILL.

159 CLEWELL ST.
AKRON, OHIO

# COMPOUNDING INGREDIENTS

ACTIVITY in the compounding ingredients market last month was so dull that not even new sets of OPA and WPB orders effecting rubber chemicals could disturb the tranquility of the scene. Distributers are looking forward to the increased production of synthetic rubber in 1943 when the demand for commodities now in a slack period because of the decreasing supply of natural rubber will again bring consumption above par. Manufacturers of materials used in reclaimed rubber continue to operate at a fair rate of production. No changes in price ceilings have occurred.

CARBON BLACK. One manufacturer reports an uptrend, due possibly to the beginning of production of reclaim tires.

CHLORINATED RUBBER. With little or no further production, goods on hand are being disposed of to essential industries, and stocks are becoming very small.

PLASTICIZERS. General Preference Order M-183, as amended November 6, brings the allocation of phosphate plasticizers into agreement with current allocation procedure by providing for the use of Forms PD-600 and PD-601, used in a large number of chemical orders.

RUBBER CHEMICALS. Demand and consumption of accelerators and antioxidants remain contingent on the amount of synthetic and crude rubber allocated by the WPB.

RUBBER SOLVENTS. General Preference Order M-159, as amended November 16, covering butyl alcohol, provides for the use of the standard chemical allocations Form PD-600 and PD-601 which were not included in the original Order M-159. These forms provide the Chemicals Division with end-use information needed for a more precise allocation of the chemicals. General Preference Order No. M-169, relating to methyl ethyl ketone, as amended November 16, provides, as in the case of butyl alcohol, for the use of the standard chemical allocations Form PD-600 and PD-601.

SULPHUR. Production of sulphur in September, 1942, declined 1% from August; the output in the first nine months of 1942 was 21% greater than in the corresponding period of 1941, and producers' stocks were increased 1% during September.

WAXES. Maximum Price Regulation No. 264, issued November 7 and effective November 13, establishes maximum prices for industrial waxes, both imported and domestic.

ZINC OXIDE. Demand in the industry shows a tendency of upward consumption, probably due to reclaimed stocks requiring somewhat larger quantities of zinc oxide and also to the fact that in some compounds a volume of rubber may be replaced with a volume of zinc oxide, thereby conserving crude rubber supplies.

## Current Quotations*

### Abrasives

| | | | |
|---|---|---|---|
| Pumicestone, powdered | lb. | $0.035 | /$0.04 |
| Rottenstone, domestic | lb. | .025 | |

### Accelerators, Inorganic

| | | | |
|---|---|---|---|
| Lime, hydrated, *l.c.l.*, New York | ton | $25.00 | |
| Litharge (commercial) | lb. | .09 | |
| Magnesia, calcined, heavy | lb. | | |
| technical, light | lb. | .0625 | /$0.07 |

### Accelerators, Organic

| | | | |
|---|---|---|---|
| A-1 | lb. | .28 | / .33 |
| A-10 | lb. | .36 | / .42 |
| A-19 | lb. | .52 | / .65 |
| A-32 | lb. | .60 | / .70 |
| A-46 | lb. | .50 | / .57 |
| A-77 | lb. | .42 | / .55 |
| A-100 | lb. | .42 | / .55 |
| Accelerator 49 | lb. | .40 | / .42 |
| 808 | lb. | .59 | / .61 |
| 833 | lb. | 1.13 | / 1.15 |
| Acrin | lb. | .65 | |
| Aldehyde ammonia | lb. | .65 | / .70 |
| Altax | lb. | .43 | / .45 |
| Arazate | lb. | 1.53 | |
| B-J-F | lb. | .38 | / .43 |
| Beutene | lb. | .59 | / .64 |
| Butasan | lb. | 1.15 | |
| Butazate | lb. | 1.13 | |
| Butyl Eight | lb. | .97 | / .99 |
| C-P-B | lb. | 1.95 | |
| Captax | lb. | .38 | / .40 |
| D-B-A | lb. | 1.95 | |
| Delac A | lb. | .39 | / .48 |
| O | lb. | .39 | / .48 |
| P | lb. | .39 | / .48 |
| Di-Esterex-N | lb. | .50 | / .57 |
| DOTG (Di-ortho-tolyguanidine) | lb. | .44 | / .46 |
| DPG (Diphenylguanidine) | lb. | .35 | / .36 |
| El-Sixty | lb. | .40 | / .47 |
| Ethasan | lb. | 1.13 | |
| Ethazate | lb. | 1.13 | |
| Ethylideneaniline | lb. | .42 | / .43 |
| Formaldehyde P.A.C. | lb. | .06 | / .0625 |
| Formaldehyde-para-toluidine | lb. | .63 | / .65 |
| Formaniline | lb. | .36 | / .37 |
| Guantal | lb. | .39 | / .48 |
| Hepteen | lb. | .34 | / .39 |
| Base | lb. | 1.25 | / 1.40 |
| Hexamethylenetetramine U.S.P. | lb. | .39 | |
| Technical | lb. | .33 | |
| Lead oleate, No. 999 | lb. | .175 | |
| Witco | lb. | .15 | |
| Ledate | lb. | 1.48 | |
| M-B-T | lb. | .38 | / .40 |
| M-B-T-S | lb. | .43 | / .45 |
| Methasan | lb. | 1.23 | |
| Methazate | lb. | 1.23 | |
| Monex | lb. | 1.53 | |
| Morfex "33" | lb. | .67 | / .72 |
| "55" | lb. | .96 | / 1.01 |
| O-X-A-F | lb. | .38 | / .43 |
| Oxynone | lb. | .77 | / .90 |
| Para-nitroso-dimethylaniline | lb. | .85 | |
| Pentex | lb. | .74 | / .84 |
| Flour | lb. | .1225 | / .1325 |
| O | lb. | | |
| Flour | lb. | | |
| Phenex | lb. | .49 | / .54 |
| Pipazate | lb. | 1.53 | |
| Pip-Pip | lb. | 1.63 | |
| R & H 50-D | lb. | .42 | / .43 |
| Rotax | lb. | .48 | / .50 |
| Safex | lb. | 1.15 | / 1.25 |
| Santocure | lb. | .60 | / .67 |
| Selenac | lb. | 1.98 | |
| SPDX | lb. | .69 | / .74 |
| A | lb. | .69 | / .74 |
| Super sulphur No. 2 | lb. | 0.13 | / 0.15 |
| Tetrone A | lb. | 2.20 | |
| Thiocarbanilide | lb. | .28 | / .33 |
| Thiofide | lb. | .43 | / .50 |
| Thionex | lb. | 1.53 | |
| Thiotax | lb. | .38 | / .45 |
| Thiurad | lb. | 1.53 | |
| Thiuram E | lb. | 1.53 | |
| M | lb. | 1.53 | |
| Trimene | lb. | .54 | / .64 |
| Base | lb. | 1.03 | / 1.18 |
| Triphenylguanidine (TPG) | lb. | .45 | |
| Tuads, Methyl | lb. | 1.53 | |
| 2-MT | lb. | .58 | / .60 |
| Ulto | lb. | .99 | / 1.04 |
| Ureka | lb. | .50 | / .57 |
| Blend B | lb. | .50 | / .57 |
| C | lb. | .48 | / .55 |
| Vulcanex | lb. | .42 | / .43 |
| Z-B-X | lb. | 2.45 | |
| Zenite | lb. | .40 | / .42 |
| A | lb. | .45 | / .47 |
| B | lb. | .42 | / .44 |
| Zimate, Butyl | lb. | 1.13 | |
| Ethyl | lb. | 1.13 | |
| Methyl | lb. | 1.23 | |
| Zipacel | lb. | 1.65 | |

### Activators

| | | | |
|---|---|---|---|
| Aero Ac 50 | lb. | .46 | / .52 |
| Barak | lb. | .50 | |
| MODX | lb. | $0.295 | /$0.345 |
| SL No. 20 | lb. | .1089 | / .1135 |

*Prices in general are f.o.b. works. Range indicates grade or quantity variations. Space limitation prevents listing of all known ingredients. Prices are not guaranteed, and those readers interested should contact suppliers for spot prices.

### Age Resisters

| | | | |
|---|---|---|---|
| AgeRite Alba | lb. | 1.95 | / 2.05 |
| Gel | lb. | .52 | / .54 |
| Hipar | lb. | .61 | / .63 |
| Powder | lb. | .43 | / .45 |
| Resin | lb. | .43 | / .45 |
| D | lb. | .43 | / .45 |
| White | lb. | 1.23 | / 1.33 |
| Albasan | lb. | .69 | / .74 |
| Aminox | lb. | .48 | / .57 |
| Antox | lb. | .54 | / .56 |
| Betanox | lb. | .48 | / .57 |
| B-L-E | lb. | .48 | / .57 |
| Powder | lb. | .64 | / .73 |
| B-X-A | lb. | .48 | / .57 |
| Copper Inhibitor X-872-A | lb. | 1.15 | |
| Flectol H | lb. | .48 | / .55 |
| White | lb. | .89 | / 1.00 |
| M-U-F | lb. | 1.48 | |
| Neozone (standard) | lb. | .61 | / .63 |
| A | lb. | .43 | / .45 |
| C | lb. | .48 | / .50 |
| D | lb. | .43 | / .45 |
| Distilled | lb. | .48 | / .50 |
| E | lb. | .61 | / .63 |
| Oxynone | lb. | .77 | / .90 |
| Permalux | lb. | 1.18 | / 1.20 |
| Santoflex B | lb. | .48 | / .55 |
| BX | lb. | .57 | / .64 |
| Santovar A | lb. | 1.15 | / 1.40 |
| Stabilite | lb. | .48 | / .69 |
| Alba | lb. | .50 | / .74 |
| Thermoflex A | lb. | .61 | / .63 |
| C | lb. | .54 | / .56 |
| Tysonite | lb. | .16 | / .165 |
| V-G-B | lb. | .48 | / .57 |

### Alkalies

| | | | |
|---|---|---|---|
| Caustic soda, flake, Columbia (400-*lb. drums*) | 100 lbs. | 2.70 | / 3.55 |
| liquid, 50% | 100 lbs. | 1.95 | |
| solid (700-*lb. drums*) | 100 lbs. | 2.30 | / 3.15 |

### Antiscorch Materials

| | | | |
|---|---|---|---|
| Antiscorch T | lb. | .90 | |
| Cumar RH | lb. | .105 | |
| E-S-E-N | lb. | .34 | / .39 |
| R-17 Resin (*drums*) | lb. | .1075 | |
| RM | lb. | 1.25 | |
| Retarder W | lb. | .36 | |
| Retardex | lb. | .445 | / .475 |
| U-T-B | lb. | .34 | / .39 |

### Antisun Materials

| | | | |
|---|---|---|---|
| Heliozone | lb. | .23 | / .24 |
| S.C.R. | lb. | .32 | / .34 |
| Sunproof | lb. | .2275 | / .2775 |
| Jr. | lb. | .165 | / .215 |

### Blowing Agents

| | | | |
|---|---|---|---|
| Ammonium Carbonate, lumps (500-*lb. drums*) | lb. | .0825 | |
| Unicel | lb. | .50 | |

### Brake Lining Saturant

| | | | |
|---|---|---|---|
| B.R.T. No. 3 | lb. | .0175 | / .0185 |

### Colors

| | | | |
|---|---|---|---|
| **Black** | | | |
| Du Pont powder | lb. | .42 | |
| Lampblack (commercial), *l.c.l.* | lb. | .15 | |
| **Blue** | | | |
| Du Pont Dispersed | lb. | .35 | / .95 |
| Powders | lb. | 2.25 | / 3.75 |
| Heliogen BKA | lb. | | |
| Toners | lb. | | |
| **Brown** | | | |
| Mapico | lb. | .1135 | |
| **Green** | | | |
| Chrome | lb. | .25 | |
| oxide (*freight allowed*) | lb. | .24 | |
| Du Pont Dispersed | lb. | .98 | / 2.85 |
| Powders | lb. | 1.00 | |
| Guignet's (*bbls.*) | lb. | .70 | |
| Toners | lb. | | |
| **Orange** | | | |
| Du Pont Dispersed | lb. | .88 | / 2.35 |
| Powders | lb. | 2.75 | / 3.05 |
| Toners | lb. | | |
| **Orchid** | | | |
| Toners | lb. | | |
| **Pink** | | | |
| Toners | lb. | | |
| **Purple** | | | |
| Toners | lb. | | |
| **Red** | | | |
| Antimony Crimson, 15/17% | lb. | | |
| R. M. P. No. 3 | lb. | .48 | |
| Sulphur free | lb. | | |
| R.M.P. | lb. | .52 | |
| Golden 15/17% | lb. | | |
| 7-A | lb. | .37 | |
| Z-2 | lb. | .25 | |
| Cadmium, light (400-*lb. bbls.*) | lb. | .80 | / .85 |
| Du Pont Dispersed | lb. | .93 | / 2.05 |
| Powders | lb. | .60 | / 1.65 |
| Iron Oxide, *l.c.l.* | lb. | .045 | / .15 |
| Mapico | lb. | .096 | |
| Rub-Er-Red (*bbls.*) | lb. | .0975 | |
| Toners | lb. | | |

**White**

| | | |
|---|---|---|
| Lithopone (*bags*) | *lb.* | $0.0425/$0.045 |
| Albalith | *lb.* | .0425/ .045 |
| Astrolith (50-*lb. bags*) | *lb.* | .0425/ .045 |
| Azolith | *lb.* | .0425/ .045 |
| Titanium Pigments | | |
| Ray-bar | *lb.* | .055 / .065 |
| Ray-cal | *lb.* | .0525/ .0625 |
| Rayox | *lb.* | .135 / .165 |
| Titanolith (50-*lb. bags*) | *lb.* | .056 / .0585 |
| Titanox-A | *lb.* | .145 / .175 |
| B | *lb.* | .0575/ .0625 |
| 30 | *lb.* | .0575/ .0625 |
| C | *lb.* | .055 / .06 |
| RC | *lb.* | .055 / .06 |
| RC-HT | *lb.* | .055 / .06 |
| Ti-Tone | *lb.* | |
| Zopaque (50-*lb. bags*) | *lb.* | .145 / .1525 |
| Zinc Oxide | | |
| Azo ZZZ-11 | *lb.* | .0725/ .075 |
| 44 | *lb.* | .0725/ .075 |
| 55 | *lb.* | .0725/ .075 |
| 66 | *lb.* | .095 / .0975 |
| French Process, Florence | | |
| Green Seal-8 | *lb.* | .09 / .0925 |
| Red Seal-9 | *lb.* | .085 / .0875 |
| White Seal-7 | *lb.* | .095 / .0975 |
| Kadox, Black Label-15 | *lb.* | .0725/ .075 |
| No. 25 | *lb.* | .085 / .0875 |
| 72 | *lb.* | .0725/ .075 |
| Red Label-17 | *lb.* | .0725/ .075 |
| Horse Head Special 3 | *lb.* | .0725/ .075 |
| XX Red-4 | *lb.* | .0725/ .075 |
| 23 | *lb.* | .0725/ .075 |
| 72 | *lb.* | .0725/ .075 |
| 78 | *lb.* | .0725/ .075 |
| 80 | *lb.* | .0725/ .075 |
| 103 | *lb.* | .0725/ .075 |
| 110 | *lb.* | .0725/ .075 |
| St. Joe (lead free) | | |
| Black Label | *lb.* | .0725/ .075 |
| Green Label | *lb.* | .0725/ .075 |
| Red Label | *lb.* | .0725/ .075 |
| U.S.P. | *lb.* | .105 / .1075 |
| Zinc Sulphide Pigments | | |
| Cryptone-BA-19 | *lb.* | .056 / .0585 |
| BT | *lb.* | .056 / .0585 |
| CB | *lb.* | .056 / .0585 |
| MS | *lb.* | .0575/ .06 |
| ZS No. 20 | *lb.* | .0825/ .085 |
| 86 | *lb.* | .0825/ .085 |
| 230 | *lb.* | .0825/ .085 |
| 800 | *lb.* | .0825/ .085 |
| Sunolith | *lb.* | .0425/ .045 |

**Yellow**

| | | |
|---|---|---|
| Cadmolith (cadmium yellow), (400-*lb. bbls.*) | *lb.* | .55 / .60 |
| Du Pont Dispersed | *lb.* | 1.25 / 1.85 |
| Powders | *lb.* | .70 / 1.75 |
| Mapico | *lb.* | .071 |
| Toners | *lb.* | |

## Dispersing Agents

| | | |
|---|---|---|
| Bardex | *lb.* | .0425/ .045 |
| Bardol | *lb.* | .025 / .0275 |
| B | *lb.* | .05 / .0525 |
| Darvan No. 1 | *lb.* | .30 / .34 |
| No. 2 | *lb.* | .30 / .34 |
| No. 3 | *lb.* | .30 / .34 |
| Nevoll (*drums, c.l.*) | *lb.* | .0225 |
| Santomerse S | *lb.* | .11 / .25 |

## Extenders

| | | |
|---|---|---|
| Extendex C | *lb.* | |
| Naftolen | *lb.* | .15 / .20 |
| "600" S | *lb.* | .14 / .16 |
| Vanzak | *gal.* | .05 / .06 |

## Fillers, Inert

| | | |
|---|---|---|
| Asbestine, *c.l.* | *ton* | 20.00 |
| Asbestos Fiber | *ton* | 15.50 / 48.00 |
| Barytes | *ton* | 40.00 |
| f.o.b., St. Louis (50-*lb. paper bags*) | *ton* | 25.55 |
| off color, domestic | *ton* | 29.00 |
| white, domestic | *ton* | 38.50 |
| Blanc fixe, dry, precip | *ton* | 80.00 |
| Calcene | *ton* | 37.50 /43.00 |
| Infusorial earth | *lb.* | .0225 |
| Kalite No. 1 | *ton* | 26.00 |
| 3 | *ton* | 36.00 |
| Kalvan | *ton* | 100.00 |
| Magnesium Carbonate, *l.c.l.* | *lb.* | .0725 |
| Paradene No. 2 (*drums*) | *lb.* | .0525 |
| Pyrax A | *ton* | 7.50 |
| Whiting | | |
| Columbia Filler | *ton* | 9.00 / 14.00 |
| Suprex White | *ton* | 32.50 |
| Witco, *c.l.* | *ton* | 8.00 |
| Witcarb | *lb.* | |

## Finishes

| | | |
|---|---|---|
| Black-Out (surface protective) | *gal.* | 4.50 / 5.00 |
| Mica, *l.c.l.* | *ton* | 20.00 /100.00 |
| Rubber lacquer, clear | *gal.* | 1.00 / 2.00 |
| colored | *gal.* | 2.00 / 3.50 |
| Shoe varnish | *gal.* | 1.45 |
| Talc | *ton* | 25.00 |

## Flock

| | | |
|---|---|---|
| Cotton flock, dark | *lb.* | .09 / .11 |
| dyed | *lb.* | .45 / .60 |
| white | *lb.* | .12 / .18 |
| Rayon flock, colored | *lb.* | 1.00 / 1.50 |
| white | *lb.* | .90 / 1.00 |

## Latex Compounding Ingredients

| | | |
|---|---|---|
| Accelerator 552 | *lb.* | 1.63 |
| Aerosol OT Aqueous 10% | *lb.* | $0.125 |
| Antox, dispersed | *lb.* | .54 |
| Aquarex D | *lb.* | .75 |
| F | *lb.* | .85 |
| MDL Paste | *lb.* | .25 |
| Areskap No. 50 | *lb.* | .18 /$0.24 |
| 100, dry | *lb.* | .39 / .51 |
| Aresket No. 240 | *lb.* | .16 / .22 |
| 300, dry | *lb.* | .42 / .50 |
| Aresklene No. 375 | *lb.* | .35 / .50 |
| 400 dry | *lb.* | .51 / .65 |
| Black No. 25, dispersed | *lb.* | .22 / .40 |
| Casein, muriatic 30 mesh | *lb.* | .20 |
| Collocarb | *lb.* | .07 |
| Color Pastes, dispersed | *lb.* | .75 / 1.10 |
| Copper Inhibitor X-872 | *lb.* | 2.25 |
| Dispersex No. 15 | *lb.* | .11 / .12 |
| No. 20 | *lb.* | .08 / .10 |
| Factex Dispersion A | *lb.* | .17 |
| Heliozone, dispersed | *lb.* | .25 |
| MICRONEX, Colloidal | *lb.* | .06 |
| R-2 Crystals | *lb.* | 1.55 |
| S-1 (400-*lb. drums*) | *lb.* | .65 |
| Santobrite Briquettes | *lb.* | |
| Powder | *lb.* | |
| Santomerse D | *lb.* | .41 / .65 |
| S | *lb.* | .11 / .25 |
| Sodium Stearate | *lb.* | .40 |
| Stablex A | *lb.* | .90 / 1.10 |
| B | *lb.* | .70 / .95 |
| C | *lb.* | .40 / .50 |
| Sulphur, dispersed | *lb.* | .10 / .15 |
| No. 2 | *lb.* | .08 / .12 |
| T-1 (440-*lb. drums*) | *lb.* | .40 |
| Tepidone | *lb.* | .63 |
| Tetrone A | *lb.* | 2.20 |
| Tysonite, dispersed | *lb.* | .32 / .35 |
| Zenite Special | *lb.* | .47 |
| Zinc oxide, dispersed | *lb.* | .12 / .15 |

## Mineral Rubber

| | | |
|---|---|---|
| Black Diamond, *l.c.l.* | *ton* | 25.00 /30.00 |
| B.R.C. No. 20 | *lb.* | .0105/ .0115 |
| Hydrocarbon, Hard | *lb.* | 25.00 /27.00 |
| MilliMar | *lb.* | .055 |
| Parmr | *ton* | |
| Pioneer, *c.l.* | *lb.* | 25.00 /27.00 |
| 285°-300° | *ton* | 25.00 /27.00 |

## Mold Lubricants

| | | |
|---|---|---|
| Aluminum Stearate | *lb.* | .21 / .24 |
| Aquarex D | *lb.* | .75 |
| MDL Paste | *lb.* | .25 |
| Colite | *gal.* | .90 / 1.15 |
| Lubrex | *lb.* | .25 / .30 |
| Mold Paste | *lb.* | .12 / .30 |
| Rubber-Glo, conc. regular | *gal.* | .94 / 1.15 |
| Type W | *gal.* | .99 / 1.20 |
| Sericite | *ton* | 65.00 |
| Soapstone, *l.c.l.* | *ton* | 22.50 |
| Zinc Stearate | *lb.* | .28 / .31 |

## Oil Resistant

| | | |
|---|---|---|
| A-X-F | *lb.* | .82 / .85 |

## Reclaiming Oils

| | | |
|---|---|---|
| B.R.V. | *lb.* | .035 / .0375 |
| C-10 | *gal.* | .19 / .24 |
| D-4 | *gal.* | .17 / .22 |
| E-5 | *gal.* | .15 / .20 |
| No. 1621 | *lb.* | .021 / .0235 |
| S.R.O. | *lb.* | .02 / .0225 |
| Type C (for synthetic rubber) | *gal.* | .33 / .38 |
| X-443 | *gal.* | .29 |

## Reenforcers

| | | |
|---|---|---|
| Carbon Black | | |
| Aerfloted Arrow Specification (*bags only*) | *lb.* | .0355† |
| Arrow Compact Granulized | *lb.* | .0355† |
| Certified Heavy Compressed (*bags only*) | *lb.* | .0355† |
| Spheron | *lb.* | .0355† |
| Channel "S" | *lb.* | .12 |
| Continental, dustless | *lb.* | .0355† |
| "AA" | *lb.* | |
| Compressed (*bags only*) | *lb.* | .0355† |
| Disperso | *lb.* | .0355† |
| Dixie | *lb.* | .0355† |
| Dixiedensed | *lb.* | .0355† |
| 66 | *lb.* | .0355† |
| Furnex | *lb.* | .035 |
| Beads | *lb.* | .035 |
| Gastex | *lb.* | .035 / .06 |
| HX | *lb.* | .0355† |
| Kosmobile | *lb.* | .0355† |
| 66 | *lb.* | .0355† |
| 77 | *lb.* | .0355† |
| S | *lb.* | .0355† |
| Kosmos | *lb.* | .0355† |
| Dixie 20 | *lb.* | .035† |
| MICRONEX Beads | *lb.* | .0355† |
| Hi-Tear | *lb.* | .0355 |
| Mark II | *lb.* | .0355 |
| Standard | *lb.* | .0355 |
| W-5 | *lb.* | .0355 |
| W-6 | *lb.* | .0355 |
| P-33 | *lb.* | .0475 |
| Pelletex | *lb.* | .035 / .06 |
| Spheron "C" (bags) | *lb.* | .0455† |
| "X" (bags) | *lb.* | .15 |
| T (bags) | *lb.* | .09 |
| Statex | *lb.* | |
| Thermax | *lb.* | .0225 |
| "S" | *lb.* | .0675 |
| TX | *lb.* | .0355† |
| Velvetex | *lb.* | |
| "WYEX BLACK" | *lb.* | .0355† |
| Carbonex Flakes | *lb.* | $0.03 /$0.035 |
| S | *lb.* | .031 / .036 |
| Plastic | *lb.* | .031 / .0335 |
| Clays | | |
| Aerofloted Hi-White | *ton* | 11.00 |
| LGB | *ton* | 15.00 |
| Paragon (50-*lb. bags*) | *ton* | 10.00 |
| Suprex (50-*lb. bags*) | *ton* | 10.00 /23.50 |
| Catalpo, *c.l.* | *ton* | 30.00 |
| China | *ton* | 25.00 |
| Dixie | *ton* | 10.00 /22.50 |
| "L" | *ton* | 10.00 |
| Langford | *ton* | 8.50 |
| McNamee | *ton* | 10.00 |
| Par | *ton* | 10.00 |
| Paraforce, *c.l.* | *ton* | 50.00 |
| Witco, *c.l.* | *ton* | 10.00 |
| Cumar EX | *lb.* | .05 |
| MH | *lb.* | .065 / .115 |
| V | *lb.* | .095 / .125 |
| 465 Resin | *lb.* | |
| "G" Resin | *lb.* | |
| Nevindene | *lb.* | |
| Silene | *lb.* | .04 / .045 |

## Reodorants

| | | |
|---|---|---|
| Amora A | *lb.* | |
| B | *lb.* | |
| C | *lb.* | |
| D | *lb.* | |
| Curodex 19 | *lb.* | |
| 188 | *lb.* | |
| 198 | *lb.* | |
| Rodo No. 0 | *lb.* | 4.00 / 4.50 |
| 10 | *lb.* | 5.00 / 5.50 |

## Rubber Substitutes

| | | |
|---|---|---|
| Black | *lb.* | .085 / .13 |
| Brown | *lb.* | .085 / .1375 |
| White | *lb.* | .09 / .15 |
| Factice | | |
| Amberex Type B | *lb.* | .1875 |
| Brown | *lb.* | .085 / .1375 |
| Fac-Cel B | *lb.* | .15 |
| C | *lb.* | .15 |
| Neophax A | *lb.* | .165 |
| B | *lb.* | .165 |
| White | *lb.* | .09 / .15 |

## Softeners and Plasticizers

| | | |
|---|---|---|
| Ambidex | *lb.* | |
| B.R.T. No. 7 | *lb.* | .02 / .021 |
| Bondogen | *lb.* | .98 / 1.05 |
| Bunnatol (for synthetic rubber) | *lb.* | .40 / .50 |
| G | *lb.* | |
| S | *lb.* | |
| Burgundy pitch | *lb.* | |
| Copene Resin | *lb.* | .32 |
| Cycline oil | *gal.* | .14 / .20 |
| Dipolymer Oil | *gal.* | .33 / .38 |
| Dispersing Oil No. 10 | *lb.* | .0375/ .04 |
| LM-Nypene f.o.b. Neville Island (*drums*) | *lb.* | .25 |
| LX-436 (*tank car*) | *lb.* | .027 |
| Myristilene | *lb.* | .20 / .30 |
| Nevinol | *lb.* | .13 / .14 |
| Nuba resinous pitch (*drums*) | | |
| Grades No. 1 and No. 2 | *lb.* | .029 |
| 3-X | *lb.* | .0425 |
| Nypene Resin | *lb.* | .32 |
| Palm oil (Witco), *c.l.* | *lb.* | |
| Palmalene | *lb.* | .15 / .25 |
| Palmol | *lb.* | .16 |
| Para Flux (reg.) | *gal.* | .17 / .18 |
| No. 2016 | *gal.* | .135 / .19 |
| Para Lube | *lb.* | .046 / .048 |
| Paradene No. 1 (*drums*) | *lb.* | .0525 |
| Special (*drums*) | | |
| 20 to 35° C. M.P. | *lb.* | .0625 |
| 35 to 45° C. M.P. | *lb.* | .0625 |
| 45 to 75° C. M.P. | *lb.* | .0575 |
| Peptizene f.o.b. Nitro, W. Va. | *lb.* | .65 |
| Piccocizer "30" | *lb.* | |
| Piccolyte Resins | *lb.* | .147 / .185 |
| Piccoumaron Resins | *lb.* | .045 / .15 |
| Pictar | *gal.* | .18 / .23 |
| Pine tar | *gal.* | |
| Oil | *gal.* | .40 / .42 |
| Plasticizer B | *lb.* | .35 / .45 |
| Plastogen | *lb.* | .0775/ .08 |
| Plastone | *lb.* | .27 / .30 |
| R-19 Resin (*drums*) | *lb.* | .1075 |
| 21 Resin (*drums*) | *lb.* | .1075 |
| Reogen | *lb.* | .115 / .12 |
| RPA No. 1E | *lb.* | .55 |
| 2 | *lb.* | .65 |
| 3 | *lb.* | .46 |
| 4 | *lb.* | .80 |
| Tackol | *lb.* | .085 / .18 |
| Tarzac | *lb.* | .23 / .24 |
| Tonox | *lb.* | .50 / .59 |
| Witco No. 20, *l.c.l.* | *gal.* | .20 |
| X-1 resinous oil (*tank car*) | *lb.* | .011 |
| XX-100 Resin | *lb.* | .0525 |

## Softeners for Hard Rubber Compounding

| | | |
|---|---|---|
| Resin C Pitch 45°C. M.P. | *lb.* | .015 / .016 |
| 60°C. M.P. | *lb.* | .015 / .016 |
| 75°C. M.P. | *lb.* | .015 / .016 |

## Solvents

| | | |
|---|---|---|
| Beta-Trichlorethane | *lb.* | .20 |
| Carbon Bisulphide | *100 lbs.* | 5.75 |
| Tetrachloride | *gal.* | .80 |

†Price quoted is f.o.b. works (bags). The price f.o.b. works (bulk) is $0.033 per pound. All prices are carlot.

| | | | |
|---|---|---|---|
| Cosol No. 1 | gal. | .26 | |
| No. 2 | gal. | .25 | |
| No. 3 | gal. | .22 | |
| Industrial 90% benzol (*tank car*) | gal. | .15 | |
| Picco | gal. | .22 | /$0.32 |
| Skellysolve | gal. | | |

### Stabilizers for Cure

| | | | |
|---|---|---|---|
| Barium Stearate | lb. | .29 | / .32 |
| Calcium Stearate | lb. | .26 | / .27 |
| Laurex (*bags*) | lb. | .1475 | / .1725 |
| Lead Stearate | lb. | | |
| Magnesium Stearate | lb. | .29 | / .32 |
| Stearex B | lb. | | |
| Beads | lb. | | |
| Stearic acid, single pressed | lb. | | |
| Stearite, *cl* | lb. | .1325 | |
| Zinc Laurate | lb. | .29 | / .32 |
| Stearate | lb. | .29 | / .31 |

### Synthetic Rubber

| | | | |
|---|---|---|---|
| Neoprene Latex Type 571 | lb. | .30 | |
| 60 | lb. | .36 | |
| Neoprene Type CG | lb. | .70 | |
| E | lb. | .65 | |
| FR | lb. | .75 | |
| G | lb. | .70 | |
| GN | lb. | .65 | |
| ILS | lb. | .70 | |
| KNR | lb. | .75 | |
| M | lb. | .65 | |
| Synthetic 100 | lb. | .41 | |
| "Thiokol" Type "A" | lb. | .35 | |
| "FA" | lb. | .50 | |
| "RD" | lb. | .70 | |

### Tackifier

| | | | |
|---|---|---|---|
| B.R.H. No. 2 | lb. | .02 | / .021 |
| LX-433 (*tank car*) | lb. | .068 | |
| P.H.O. (*drums*) | lb. | .24 | |

### Vulcanizing Ingredients

| | | | |
|---|---|---|---|
| Magnesia, light (for neoprene) | lb. | .25 | |
| Sulphur | 100 lbs. | 2.05 | |
| Chloride (*drums*) | lb. | .04 | |
| Telloy | lb. | 1.75 | |
| Thiogen 6 | lb. | | |
| 10 | lb. | | |
| Vandex | lb. | 1.75 | |
| (See also Colors—Antimony) | | | |

### Waxes

| | | | |
|---|---|---|---|
| 736 (clear) | gal. | 1.25 | |
| 737 (black) | gal. | 1.35 | |
| 1515-A (black) | gal. | 1.35 | |
| Carnauba, No. 3 chalky | lb. | .7125 | |
| 2 N.C. | lb. | .84 | |
| 3 N.C. | lb. | .79 | |
| 1 Yellow | lb. | .8325 | |
| 2 | lb. | .8125 | |
| Carnube | lb. | .46 | / .56 |
| Monten | lb. | .12 | / .17 |
| Rubber Wax No. 118, Neutral | gal. | .76 | / 1.31 |
| Colors | gal. | .86 | / 1.41 |

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**L. A. Standard Rubber Co.**, 1580 E. Slauson Ave., Los Angeles, Calif., has changed its name to Standard Rubber, Inc.

**L. R. Shannon** of the Firestone Rubber & Latex Products Co., Fall River, Mass., has been elected a member of the Controllers Institute of America, 1 E. 42nd St., New York, N. Y.

## Tire and Tube Quotas for December, 1942*

| United States and Territories | Passenger and Motorcycle, Etc. | | | | | Truck, Bus, Farm Tractor Implement, Etc. | | |
|---|---|---|---|---|---|---|---|---|
| Region | New Grade I Tires | New Grade II Tires | Grade III Tires | Recapping Services | Tubes | Tires | Recapping Services | Tubes |
| No. 1 Maine | 636 | 2,388 | 5,324 | 5,370 | 2,150 | 2,492 | 1,153 | 1,064 |
| New Hampshire | 404 | 1,529 | 3,330 | 3,404 | 1,364 | 1,138 | 710 | 523 |
| Vermont | 311 | 960 | 2,516 | 2,325 | 938 | 1,009 | 434 | 424 |
| Massachusetts | 3,375 | 10,571 | 26,955 | 25,862 | 10,265 | 6,518 | 2,627 | 2,706 |
| Rhode Island | 663 | 2,086 | 5,433 | 5,173 | 2,043 | 1,223 | 518 | 519 |
| Connecticut | 1,664 | 7,212 | 15,841 | 16,154 | 6,371 | 4,606 | 2,337 | 2,008 |
| BOSTON SUB-TOTAL | 7,053 | 24,746 | 59,399 | 58,288 | 23,131 | 16,986 | 7,809 | 7,244 |
| No. 2 New York State | 11,646 | 25,583 | 71,365 | 66,960 | 27,135 | 19,337 | 6,746 | 7,818 |
| New Jersey | 3,574 | 10,892 | 30,816 | 27,684 | 11,019 | 7,202 | 3,020 | 3,013 |
| Pennsylvania | 8,220 | 30,947 | 65,849 | 69,228 | 27,503 | 17,981 | 8,004 | 7,616 |
| Delaware | 288 | 950 | 2,077 | 2,143 | 867 | 778 | 383 | 337 |
| Maryland | 2,605 | 8,671 | 15,025 | 17,752 | 7,307 | 5,694 | 2,138 | 2,332 |
| District of Columbia | 2,153 | 2,066 | 4,818 | 6,344 | 2,624 | 1,210 | 447 | 494 |
| NEW YORK SUB-TOTAL | 28,486 | 79,118 | 189,950 | 190,111 | 76,455 | 52,202 | 20,738 | 21,610 |
| No. 3 Ohio | 6,570 | 24,262 | 57,344 | 56,413 | 22,392 | 16,205 | 7,025 | 6,826 |
| Kentucky | 1,768 | 6,582 | 13,445 | 14,368 | 5,765 | 5,429 | 3,189 | 2,454 |
| West Virginia | 1,189 | 4,663 | 8,578 | 9,650 | 3,915 | 4,192 | 2,411 | 1,885 |
| Michigan | 5,952 | 17,434 | 49,905 | 44,506 | 17,797 | 13,007 | 4,897 | 5,331 |
| Indiana | 3,387 | 12,983 | 25,657 | 27,901 | 11,205 | 10,525 | 4,751 | 4,471 |
| CLEVELAND SUB-TOTAL | 18,866 | 65,924 | 154,929 | 152,847 | 61,074 | 49,358 | 22,273 | 20,967 |
| No. 4 Virginia | 2,481 | 7,956 | 15,970 | 17,644 | 7,091 | 7,989 | 4,534 | 3,579 |
| North Carolina | 2,827 | 7,197 | 17,788 | 17,709 | 7,239 | 9,872 | 5,653 | 4,433 |
| South Carolina | 1,703 | 4,016 | 9,911 | 9,747 | 4,009 | 4,075 | 2,247 | 1,813 |
| Georgia | 2,512 | 6,419 | 15,070 | 15,011 | 6,199 | 7,940 | 4,371 | 3,530 |
| Florida | 2,464 | 5,790 | 14,150 | 13,789 | 5,744 | 7,495 | 4,171 | 3,342 |
| Tennessee | 2,222 | 6,063 | 13,091 | 13,561 | 5,626 | 7,592 | 4,496 | 3,439 |
| Alabama | 1,925 | 6,175 | 11,402 | 13,305 | 5,365 | 6,182 | 3,580 | 2,784 |
| Mississippi | 1,418 | 3,055 | 6,903 | 7,222 | 3,011 | 5,516 | 2,470 | 2,339 |
| ATLANTA SUB-TOTAL | 17,552 | 46,671 | 104,303 | 107,988 | 44,284 | 56,661 | 31,522 | 25,259 |
| No. 5 Missouri | 3,810 | 9,268 | 25,000 | 23,154 | 9,488 | 10,494 | 4,902 | 4,491 |
| Kansas | 2,049 | 5,648 | 15,839 | 14,252 | 5,759 | 7,187 | 3,062 | 3,017 |
| Oklahoma | 2,538 | 6,212 | 15,122 | 14,704 | 6,109 | 7,761 | 3,033 | 3,203 |
| Arkansas | 1,007 | 2,829 | 6,629 | 7,157 | 2,749 | 5,081 | 2,622 | 2,224 |
| Texas | 7,712 | 16,617 | 41,973 | 39,893 | 16,880 | 25,633 | 9,475 | 10,470 |
| Louisiana | 1,741 | 4,106 | 11,967 | 10,275 | 4,223 | 6,187 | 1,855 | 2,441 |
| DALLAS SUB-TOTAL | 18,857 | 44,680 | 115,630 | 109,435 | 45,208 | 62,343 | 24,949 | 25,846 |
| No. 6 Illinois Excl. Met. Chicago | 3,308 | 11,719 | 29,908 | 28,158 | 11,176 | 11,473 | 3,154 | 4,469 |
| Met. Chicago | 3,664 | 8,322 | 26,671 | 23,463 | 9,296 | 7,404 | 3,439 | 3,165 |
| Iowa | 2,468 | 6,862 | 21,236 | 18,109 | 7,268 | 7,072 | 1,974 | 2,760 |
| Nebraska | 1,258 | 3,272 | 9,541 | 8,553 | 3,428 | 5,048 | 1,789 | 2,047 |
| North Dakota | 532 | 1,337 | 4,385 | 3,653 | 1,472 | 1,874 | 354 | 698 |
| South Dakota | 557 | 1,616 | 4,846 | 4,190 | 1,680 | 2,362 | 771 | 944 |
| Minnesota | 2,542 | 6,752 | 23,270 | 18,973 | 7,545 | 5,792 | 1,789 | 2,295 |
| Wisconsin | 2,673 | 8,086 | 24,227 | 21,119 | 8,379 | 5,669 | 2,238 | 2,344 |
| CHICAGO SUB-TOTAL | 17,002 | 47,966 | 144,084 | 126,218 | 50,244 | 46,694 | 15,508 | 18,722 |
| No. 7 Montana | 591 | 1,493 | 4,146 | 3,717 | 1,531 | 2,596 | 1,035 | 1,075 |
| Idaho | 604 | 1,513 | 3,941 | 3,645 | 1,515 | 2,421 | 1,220 | 1,054 |
| Wyoming | 306 | 774 | 2,070 | 1,893 | 782 | 1,304 | 505 | 537 |
| Colorado | 1,382 | 3,994 | 10,603 | 9,996 | 3,981 | 4,840 | 1,699 | 1,959 |
| Utah | 577 | 2,019 | 4,104 | 4,357 | 1,774 | 3,021 | 1,633 | 1,337 |
| New Mexico | 526 | 1,068 | 2,727 | 2,565 | 1,099 | 2,530 | 939 | 1,034 |
| DENVER SUB-TOTAL | 3,986 | 10,861 | 27,591 | 26,173 | 10,682 | 16,712 | 7,031 | 6,996 |
| No. 8 Washington | 1,937 | 6,409 | 17,059 | 15,778 | 6,266 | 4,884 | 2,194 | 2,073 |
| Oregon | 1,660 | 4,976 | 11,714 | 11,525 | 4,695 | 7,190 | 3,338 | 3,073 |
| Northern California | 4,057 | 13,613 | 35,968 | 33,399 | 13,250 | 11,390 | 6,416 | 5,093 |
| Southern California | 5,108 | 20,019 | 52,248 | 48,657 | 19,069 | 9,350 | 4,984 | 4,125 |
| Nevada | 178 | 525 | 1,301 | 1,276 | 509 | 1,267 | 620 | 548 |
| Arizona | 582 | 1,610 | 3,842 | 3,790 | 1,546 | 3,772 | 2,021 | 1,666 |
| SAN FRANCISCO SUB-TOTAL | 13,522 | 47,152 | 122,132 | 114,425 | 45,335 | 37,853 | 19,573 | 16,578 |
| No. 9 Puerto Rico | 460 | 381 | 1,309 | 1,262 | 558 | 512 | 111 | 193 |
| Virgin Islands | 106 | 11 | — | — | 42 | 33 | — | 11 |
| Canal Zone | 43 | 153 | 673 | 498 | 187 | 472 | 6 | 159 |
| Alaska | 164 | 37 | — | — | 72 | 403 | | 135 |
| WASHINGTON, D. C. SUB-TOTAL | 773 | 582 | 1,982 | 1,760 | 859 | 1,420 | 117 | 498 |
| TOTAL U. S. AND TERRITORIES EXCL. RESERVES | 126,097 | 368,000 | 920,000 | 887,245 | 357,272 | 340,229 | 149,520 | 143,720 |

*The quotas listed do not include reserves.

# COTTON & FABRICS

NEW YORK COTTON EXCHANGE WEEK-END CLOSING PRICES

| | Sept. 26 | Oct. 31 | Nov. 7 | Nov. 14 | Nov. 21 | Nov. 28 |
|---|---|---|---|---|---|---|
| Futures | | | | | | |
| Dec. | 18.37 | 18.39 | 18.65 | 18.58 | 18.51 | 18.60 |
| Mar. | 18.59 | 18.50 | 18.78 | 18.64 | 18.54 | 18.34 |
| July | 18.79 | 18.64 | 18.97 | 18.71 | 18.46 | 18.10 |
| Oct. | | 18.73 | 19.08 | 18.78 | 18.40 | 18.21 |

## New York Quotations

**November 24, 1942**

### Drills

| | | |
|---|---|---|
| 38-inch 2.00-yard | yd. | .... |
| 40-inch 1.45-yard | | .... |
| 50-inch 1.52-yard | | $0.29 |
| 52-inch 1.85-yard | | .23⅞ |
| 52-inch 1.90-yard | .23223 | .23¼ |
| 52-inch 2.20-yard | | .20511 |
| 52-inch 2.50-yard | | .185 |
| 59-inch 1.85-yard | | .23851 |

### Ducks

| | | |
|---|---|---|
| 38-inch 2.00-yard D. F. | yd. .21½ | .22⅝ |
| 40-inch 1.45-yard S. F. | | .29¾ |
| 51½-inch 1.35-yard D. F. | | .33½ |
| 72-inch 1.05-yard D. F. | .43 | .45 |
| 72-inch 17-21 ounce | | .48⅞ |

#### Mechanicals

| | | |
|---|---|---|
| Hose and belting | lb. | .42¾ |

#### Tennis

| | | |
|---|---|---|
| 51½-inch 1.35-yard | yd. | .31½ |
| 51½-inch 1.60-yard | yd. | .27⅛ |
| 51½-inch 1.90-yard | yd. | .23⅛ |

### Hollands—White

#### Blue Seal

| | | |
|---|---|---|
| 20-inch | yd. | .13½ |
| 30-inch | | .24¼ |
| 40-inch | | .27 |

#### Gold Seal

| | | |
|---|---|---|
| 20-inch No. 72 | yd. | .14½ |
| 30-inch No. 72 | | .25¾ |
| 40-inch No. 72 | | .29 |

#### Red Seal

| | | |
|---|---|---|
| 20-inch | yd. | .12¼ |
| 30-inch | | .22 |
| 40-inch | | .24½ |

### Osnaburgs

| | | |
|---|---|---|
| 40-inch 2.34-yard | yd. | .15½ |
| 40-inch 2.48-yard | | .14⅝ |
| 40-inch 2.56-yard S. F. | | .14578 |
| 40-inch 3.00-yard | | .12¾ |
| 40-inch 7-ounce part waste | | .15 |
| 40-inch 10-ounce part waste | | .21⅜ |
| 37-inch 2.42-yard clean | | .15¼ |

### Raincoat Fabrics

#### Cotton

| | | |
|---|---|---|
| Bombazine 64 x 60 | yd. | .... |
| Plaids 60 x 48 | | .... |
| Surface prints 64 x 60 | | .... |
| Print cloth, 38½-inch, 64 x 60 | | .08971 |

#### Sheetings, 40-inch

| | | |
|---|---|---|
| 48 x 48, 2.50-yard | yd. | .16200 |
| 64 x 68, 3.15-yard | | .13968 |
| 56 x 60, 3.60-yard | | .11944 |
| 44 x 40, 4.25-yard | | .09764 |

#### Sheetings, 36-inch

| | | |
|---|---|---|
| 48 x 48, 5.00-yard | yd. | .08600 |
| 44 x 40, 6.15-yard | | .06991 |

### Tire Fabrics

#### Builder

| | | |
|---|---|---|
| 17¼ ounce 60" 23/11 ply Karded peeler | lb. | .53 |

#### Chafer

| | | |
|---|---|---|
| 14 ounce 60" 20/8 ply Karded peeler | lb. | .52 |
| 9¼ ounce 60" 10/2 ply Karded peeler | lb. | .52 |

#### Cord Fabrics

| | | |
|---|---|---|
| 23/5/3 Karded peeler, 1⅜" cotton | lb. | .53 |
| 15/3/3 Karded peeler, 1⅜" cotton | lb. | .51 |
| 12/4/2 Karded peeler, 1⅜" cotton | lb. | .52 |
| 23/5/3 Karded peeler, 1¼" cotton | lb. | .53 |

#### Leno Breaker

| | | |
|---|---|---|
| 8¼ ounce and 10¼ ounce 60" Karded peeler | lb. | .53 |

A STEADY November market was broken by a sharp decline of 50 points on November 23 when the 15/16-inch middling spot cotton dropped from 20.20¢ a pound to 19.70¢. Reports of a possibility of a separate peace with Italy influenced the market considerably, causing heavy liquidation, and dampened buying enthusiasm in general. In the early part of the month cotton prices lifted after an encouraging statement from Price Administrator Henderson that there would be a 25-point increase in the parity price and that no ceilings would be issued by the OPA. Recent criticism by government officials and members of the trade of British demands for high-quality cotton in lend-lease orders brought an answer by the Department of Agriculture which assured the critics that England receives only such long-staple cotton as is necessary for the proper conduct of the war. A worthy campaign for more research in cotton textiles was aided by the recent actions of Rubber Director Jeffers who ordered rayon for tires despite the protests of Cotton State Senators who thought cotton would be suitable provided the rubber program could wait 60 or more days while tests were conducted.

Cotton farmers were called by Secretary of Agriculture Wickard to vote on December 12 on cotton marketing quotas, as the supply of 24.7 million bales of cotton for the 1942-43 marketing year is 130% of normal supply. With quotas, the farmers are allowed to market all cotton grown on their acreage allotments (to be announced in December) without fear of penalty.

A crop forecast of 13,329,000 bales lowered the October 1 prediction of the Department of Agriculture by 489,000 bales. This is the largest crop in five years, but the quality will not be high enough to fulfill orders for the long-staple "military grade." Insects, rain, and lack of pickers were factors in reducing the amount of high-grade cotton. Meanwhile the government, through Commodity Credit Corp., continues to make the growing of 1⅛-inch staple cotton as attractive as possible to farmers so that more acreage will be devoted to this grade next year.

The price of 15/16-inch spot middling grade rose from 20.13¢ a pound on November 2 to 20.40¢ on November 5, dropped to 19.70¢ on November 23, and closed at 20.35¢ on December 3.

An Amendment 1 to General Conservation Order M-236, issued October 24 and effective October 27, permits the removal of samples of imported long-staple cotton from customs without authorization of the WPB.

### Fabrics

Government requirements are absorbing most of the coarse gray goods market with several awards going to rubber firms to make synthetic resin-coated cotton sheeting and a 6,000,000-yard award for balloon cloth given out by the Army Depot. Sales of 3.60- and 3.15-yard sheetings for military raincoats were booked well into next year. There is also a report that the Army is considering the possibility of using rayon for raincoats as present coated cloths tend to crack and leak after long exposure.

Tire fabric prices continue to rise and are up another ½¢ a pound. Some drills have declined as much as 2¢ a yard; while sheetings, ducks, osnaburgs, and hollands remain unchanged.

## Dividends Declared

| COMPANY | STOCK | RATE | PAYABLE | STOCK OF RECORD |
|---|---|---|---|---|
| Anaconda Wire & Cable Co. | Com. | $0.25 | Dec. 21 | Dec. 11 |
| Armstrong Cork Co. | Com. | 0.25 interim | Dec. 1 | Nov. 9 |
| Armstrong Cork Co. | Cum. Conv. Pfd. | 1.00 q. | Dec. 15 | Dec. 1 |
| Belden Mfg. Co. | Com. | 0.37½ | Nov. 30 | Nov. 16 |
| Boston Woven Hose & Rubber Co. | 6% Pfd. | 3.00 | Dec. 15 | Dec. 1 |
| Boston Woven Hose & Rubber Co. | Com. | 0.50 extra | Nov. 25 | Nov. 16 |
| Boston Woven Hose & Rubber Co. | Com. | 0.50 | Nov. 25 | Nov. 16 |
| Canada Wire & Cable Co., Ltd. | Class A | 1.00 q. | Dec. 15 | Nov. 30 |
| Canada Wire & Cable Co., Ltd. | Class B | 0.50 q. | Dec. 15 | Nov. 30 |
| Canada Wire & Cable Co., Ltd. | 6½% Pfd. | 1.62½ q. | Dec. 15 | Nov. 30 |
| Crown Cork & Seal Co. | Pfd. | 0.56¼ q. | Dec. 15 | Nov. 30 |
| Detroit Gasket & Mfg. Co. | 6% Cum. Pfd. | 0.30 q. | Dec. 1 | Nov. 14 |
| Dewey & Almy Chemical Co. | Com. | 0.25 | Dec. 15 | Nov. 30 |
| Dewey & Almy Chemical Co. | Class B | 0.25 | Dec. 15 | Nov. 30 |
| Dominion Textile Co., Ltd. | Pfd. | 1.75 q. | Jan. 15 | Dec. 15 |
| Dunlop Tire & Rubber Corp. | Com. | 0.50 | Dec. 21 | Dec. 15 |
| Dunlop Tire & Rubber Corp. | 1st Pfd. | 0.62½ s. | Dec. 31 | Dec. 15 |
| E. I. du Pont de Nemours & Co., Inc. | Com. | 1.00 yr. end | Jan. 14 | Dec. 23 |
| E. I. du Pont de Nemours & Co., Inc. | $4.50 Pfd. | 1.12½ q. | Jan. 25 | Jan. 8 |
| Electric Storage Battery Co. | Com. | 0.50 | Dec. 22 | Dec. 2 |
| Faultless Rubber Co. | Com. | 0.50 yr. end | Jan. 1 | Dec. 15 |
| Firestone Tire & Rubber Co. | 6% Pfd. A | 1.50 q. | Dec. 1 | Nov. 14 |
| Flintkote Co. | Com. | 0.35 yr. end | Dec. 21 | Dec. 11 |
| Flintkote Co. | $4.50 Cum. Pfd. | 1.12½ q. | Dec. 21 | Dec. 11 |
| General Electric Co. | Com. | 0.35 | Jan. 25 | Dec. 18 |
| General Motors Corp. | Com. | 0.50 | Dec. 12 | Nov. 12 |
| B. F. Goodrich Co. | Com. | 0.50 | Dec. 22 | Dec. 18 |
| B. F. Goodrich Co. | $5 Pfd. | 1.25 q. | Dec. 31 | Dec. 18 |
| Goodyear Tire & Rubber Co. | Com. | 0.25 | Dec. 15 | Nov. 14 |
| Goodyear Tire & Rubber Co. | $5 Cum. Conv. Pfd. | 1.25 q. | Dec. 15 | Nov. 14 |
| Hercules Powder Co. | Com. | 0.90 yr. end | Dec. 21 | Dec. 10 |
| Hewitt Rubber Corp. | Com. | 0.25 | Dec. 15 | Dec. 1 |
| Hewitt Rubber Corp. | Com. | 0.25 q. | Dec. 15 | Dec. 1 |
| I. B. Kleinert Rubber Co. | Com. | 0.30 | Dec. 11 | Dec. 1 |
| Midwest Rubber Reclaiming Co. | $4 Pfd. | 1.00 q. | Dec. 1 | Nov. 20 |
| Midwest Rubber Reclaiming Co. | Com. | 0.50 | Oct. 28 | Oct. 16 |
| Norwalk Tire & Rubber Co. | Pfd. | 1.31¼ accum. | Jan. 2 | Dec. 15 |
| Pharis Tire & Rubber Co. | Com. | 0.15 | Nov. 10 | Oct. 31 |
| Phelps Dodge Copper Corp. | Com. | 0.40 | Dec. 10 | Nov. 25 |
| Raybestos-Manhattan, Inc. | Com. | 0.87½ yr. end | Dec. 15 | Nov. 30 |
| Rome Rubber Corp. | Com. | 0.15 irrig. | Dec. 30 | Dec. 9 |
| Russell Mfg. Co. | Com. | 0.50 | Dec. 15 | Nov. 30 |
| Thermoid Co. | $3 Pfd. | 0.75 q. | Dec. 15 | Dec. 3 |
| Thermoid Co. | Com. | 0.30 | Dec. 15 | Dec. 3 |
| Tyer Rubber Co. | Com. | 0.50 | Nov. 14 | Nov. 6 |
| United States Rubber Co. | 8% Non-Cum. 1st Pfd. | 4% | Dec. 18 | Dec. 4 |
| Westinghouse Electric Mfg. Co. | Pfd. | 0.50 yr. end | Dec. 22 | Dec. 8 |

## FROM THE SKIES ABOVE ALGIERS . . .

America's invasion forces took over airfields and other key points in Northern Africa in record time. An operation of this kind calls for equipment-carrying "chutes" in great numbers—chutes made of fine cottons.

In addition to the priority "musts" for our airplane cloth, balloon cloth, drills, twills and Vinyon* fibre fabrics, many other fabrics used by the Rubber Industry—for example, Hose Duck, Numbered Duck and Belting Duck—are necessarily not available at this time except on a priority basis.

* Reg. U. S. Pat. Off. C. & C. C. C.

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Light face type 40c per line (ten words)
Bold face type 55c per line (eight words)

SITUATIONS OPEN RATES
Light face type 75c per line (ten words)
Bold face type $1.00 per line (eight words)
*Replies forwarded without charge*

## SITUATION WANTED

PRODUCTION SUPERINTENDENT DESIRES CHANGE. NOW employed as such. Qualified by twenty years of broad practical experience to estimate costs, plan processes, compound and supervise the manufacturing of mechanical, sponge and synthetic rubber products. Position as technical superintendent desired. Address Box No. 514, care of INDIA RUBBER WORLD.

## SITUATIONS OPEN

CHEMIST—EXPERIENCED IN THE COMPOUNDING OF VARIOUS types of adhesives—non-rubber and rubber. Must be familiar with reclaim and synthetic rubber. Give age, references, and full particulars about previous experience in first letter. Salary commensurate with experience. This plant is located in Lynn, Mass. Address Box No. 504, care of INDIA RUBBER WORLD.

**PLANT MANAGER—BY CONNECTICUT RUBBER manufacturer. Must be experienced on sundries, mold work, and handling employes. Give full experience, personal history, salary required, and draft standing in first letter. Address Box No. 505, care of INDIA RUBBER WORLD.**

CHEMIST AND RESEARCH DEVELOPMENT. SMALL, FINANcially strong company requires services of man in plant specializing in molded goods and synthetic products. Some experience in Latex and Plastics desirable. Give full data including salary, draft status, and experience. Location of plant, approximately 200 miles East of Cleveland. Address Box No. 506, care of INDIA RUBBER WORLD.

WANTED: A MAN WITH ESTABLISHED CONTACTS IN VARIous branches of the rubber industry to handle line of knitted cotton fabrics. Or a man already contacting rubber trades with textile or related merchandise. We are now serving this trade. For a front-rank man this represents a first-rate opportunity. Write full details to Box No. 507, care of INDIA RUBBER WORLD.

## SITUATIONS OPEN (Continued)

**TIRE EQUIPMENT AND CONSTRUCTION ENGINEER**
**An old-established tire manufacturer wishes to employ a tire engineer experienced in mold designing and construction development work. Give full experience, personal history, draft status, and salary expected. Strictly confidential. Reply to Box No. 513, care of INDIA RUBBER WORLD.**

WANTED: CHEMIST—EXPERIENCED IN ADHESIVES, FLEXIBLE coatings, and treatments. Manufacturer engaged in war and civilian production. Give full particulars and salary expected. Address Box No. 508, care of INDIA RUBBER WORLD.

WANTED: DENSE-RUBBER CHEMIST FAMILIAR WITH REclaim and synthetics. Sponge rubber experience helpful. Must be over 45 or have 3A classification. Real opportunity in small company. Address Box No. 509, care of INDIA RUBBER WORLD.

SUPERINTENDENT TO TAKE FULL CHARGE OF MODERN RElaimed rubber plant. This is a permanent position for a capable and experienced man. Please give full particulars as to qualifications. Address Box No. 517, care of INDIA RUBBER WORLD.

ENGINEER, VERSATILE, EXPERIENCED IN EXTRUDED RUBber industry with ability to adapt his experience to Extruded Plastic field. Factory located in New York with efficient mechanical and tool making facilities. State age, experience in detail, and salary requirements. Address Box No. 518, care of INDIA RUBBER WORLD.

## BUSINESS OPPORTUNITY

FOR SALE: 1—COMPLETE PLANT FOR THE MANUFACTURE of Saturated and Spreader Fabrics located at Hudson, Massachusetts. Address Box No. 512, care of INDIA RUBBER WORLD.



(*Classified Advertisements Continued on Page 329*)

# Classified Advertisements

Continued

## MACHINERY AND SUPPLIES FOR SALE

FOR SALE: 1—Southwark 1000-Ton Hydraulic Press, 24" dia. ram, complete with horizontal Hydraulic Pump and motor; 1—W.S. Hydro-Pneumatic Accumulator 2500 PSI, 8 gal., with IR m.d. compressor; 1—Hydro-Pneumatic Accumulator, 2000 PSI, 16⅓ gals., complete with tank, compressor and pipings; 1—Set of Compounding Rolls, 18" x 44"; 1—W.S. 15" x 18" Hyd. Press, 9" dia. ram, 4" posts; 6—Semi-Automatic Hydraulic Molding Presses; 1—Farrel-Birmingham 16" x 36" Rubber Mill; Adamson 6" Tuber; 7—W.&P. Mixers; Dry Mixers, Pulverizers, Grinders, Tubers, Hydraulic Pumps, Calenders, etc. CONSOLIDATED PRODUCTS CO., INC., 13-16 Park Row, New York, N. Y.

FOR SALE: Birmingham Heavy-Duty Mixing Mill, 16" x 40", complete and reconditioned, rolls and journals reground, bearings refinished, first-class unit. Hydraulic Press, 8 openings each 3", 30" x 52" x 2" steel steam platens, 2—14" dia. x 23" stroke rams, with pump, motor, valves, piping, fittings, etc., forming complete unit. Excellent condition. Also other mills and presses, varying sizes and capacities, pumps, accumulators, calenders, vulcanizers, boilers, motor, etc. INDUSTRIAL EQUIPMENT COMPANY, 870 Broad Street, Newark, N. J.

FOR SALE: 3—HYDRAULIC PRESSES; 7—CHANGE CAN MIXERS, 8 to 40 gals.; No. 20 Banury Mixer; W. & P. Mixers, Lab. to 200 gal.; 6—Preforming Machines; 3—Vacuum Shelf Driers. Your inquiries solicited. BRILL EQUIPMENT COMPANY, 183 Varick St., New York, N. Y.

FOR SALE: 2—4-roll Washers; 2—2-roll Washers; 1—48" Mill; 3—40" Mills; 1—36" Mill; 2—Span Grinders; 1—Bonnot Pulverizer, a complete unit for grinding hard rubber scrap; 1—Taylor-Stiles Rubber Chopper; 2—Hydraulic Presses; 4—Rubber Spreaders; 1—72" Doubling Calender; 1—60" Facing Calender; 3—Textile Calenders; 6—Hydraulic Tire Vulcanizers; 1—Curtis & Marble Brush Machine. Address Box No. 511, care of INDIA RUBBER WORLD.

## MACHINERY AND SUPPLIES WANTED

WANTED: TENSILE TESTER, SHORE DUROMETER TYPE A, AND electric laboratory oven with heat to 110° C. AIRLASTIC RUBBER CO., 904 Blackhawk St., Chicago, Ill.

**WANTED BY RUBBER MANUFACTURER FOR War Production, four hydraulic presses, steam-heated platens 24" x 24" x 14" ram preferred, but will consider any size you have for immediate delivery. Describe fully. Address Box No. 510, care of INDIA RUBBER WORLD.**

WANTED TO BUY: LABORATORY MILL OR SMALL MILL IN good condition, also small mandrel cropping machine and washer cutter. Address Box No. 515, care of INDIA RUBBER WORLD.

WANTED: Banbury Mixer, Mills, Calender, Hydraulic Presses, with pump and accumulator, Tubers. Any Condition. Address Box No. 516, care of INDIA RUBBER WORLD.

WANT TO PURCHASE: ONE USED LABORATORY MILL. MUST be in A-1 shape with all parts, including motor. Address Box No. 519, care of INDIA RUBBER WORLD.

## MISCELLANEOUS

FOR SALE: 20-THOUSAND POUNDS OF COMPOUND STOCK, mostly black. 40% rubber hydrocarbon or better. W. J. CALEY & COMPANY, 3214 Chestnut St., Philadelphia, Pa.

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*for Christmas and the New Year*



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